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"THE TIMES" OF THE TRANSPORT WORLD

RAILBUS  
TYPES FOR  
BRITISH  
RAILWAYS

See Pages 2 and 3

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LONDON, AUGUST 23, 1958

PRICE NINEPENCE

### Speeding London Port Traffic

THE decision of the Port of London Authority to introduce the first stage of a Thames navigation service has been followed by the commencement of a new building adjoining Royal Terrace Pier, Gravesend, and the placing of orders for radio-telephone equipment and for a harbour radar set to maintain continuous surveillance of Gravesend Reach. This from the operational viewpoint is the most critical stretch of the river between the Nore and London Bridge. Reference is made on page 12 of this issue to the order for the harbour radar and it is typical of the care with which planning is being carried out that the equipment ordered, while more than adequate for the tasks envisaged, can be replaced by a more elaborate and expensive version should circumstances subsequently require a higher degree of definition. Experience of harbour radar at a number of important ports throughout the world has demonstrated clearly, both to shipowners and to port authorities, that these systems, in conjunction with the marine v.h.f. communication frequencies standardised last year at The Hague, offer great advantages and economies both in time and money. Although only the first stage is being undertaken at present, the Thames navigation service seems almost bound to involve a remarkably comprehensive harbour radar system and this, used in conjunction with the radio telephone and the other information co-ordinated in the operations room should accelerate the movement of traffic on the tideway whatever the weather conditions prevailing.

### B.M.C. Records

IT was announced last week by Sir Leonard Lord, the chairman, that during the financial year ended July 31, the British Motor Corporation produced and sold 504,712 vehicles of all types. This is the highest figure ever achieved by any British or European manufacturer in a 12-month period; in fact the figure has only been exceeded in the U.S.A. It is 65,000 vehicles more than the corporation's previous best financial year (1955-56). Export deliveries were 16 per cent greater than in 1956-57. There was a spectacular increase in deliveries to dollar markets and especially to the U.S.A., which for the first time took the lead from Australia. During the year the corporation earned \$75 million from American sources. The corporation is now selling to almost every country in the world, including Poland, Bulgaria, Czechoslovakia, Yugoslavia and China. Extensive chains of distributors and dealers are operating sales and service activities wherever B.M.C. vehicles are marketed. After the U.S.A., the corporation's largest markets were Australia, South Africa, Canada, New Zealand and Sweden in that order. Apart from deliveries of complete and unassembled vehicles, B.M.C. is also selling engines and transmissions to vehicle manufacturers in the U.S.A., Germany, Spain and China for use in their production.

### Reduced London Bus Services

LAST Tuesday London Transport issued a new poster which was displayed from August 19 in connection with reductions in bus services on a number of routes. "On some routes the demand for buses is steady or rising, on others it is falling," it states. "It is the constant task of London Transport to gauge, as accurately as possible, its passengers' requirements and, with a practised eye on the whole pattern of London's needs, to provide for them. The present reductions in service on a number of routes, and the withdrawal of service on a few, have been planned to meet the falling demand where fewer people are using the buses. The money saved by these reductions in bus mileage—and it is considerable—will enable London Transport to continue to offer full service where it is most needed. London's red buses serve 3,900 miles of route. During the rush hours 5,400 buses and 1,400

trolleybuses are on the road—the largest urban bus system in the world." The changes of August 20 or 24 are the first instalment of a 9 per cent reduction to be made over a period extending into 1959 to cope with a traffic fall of more than 10 per cent as a result of the seven-week strike. In total, as already indicated in our news columns, 22 routes are withdrawn, two curtailed and seven extended; one (171) is diverted from Kingsway and the Embankment to Chancery Lane and Waterloo Bridge to cover the withdrawal of 67 and there is a new route, 189A, between Clapham Common and Worcester Park covering parts of 189 and 127. Only

in revenue will have to be found by other means, including administrative economies. It is at least gratifying that not all London busmen approve working to rule, with its further deterrent effects on public favour, as a means of protesting at the cuts they themselves made unavoidable.

### New Tube Trains for London

A CONSIDERABLE step towards the modernisation of the tube railway rolling stock of London Transport has been taken this week with the announcement of a £10,120,000 order for 76 seven-car

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four short sections of road lose buses completely: Manor Road, Chigwell; Aylmer Road, East Finchley; Parkstone Avenue, Emerson Park; and a stretch of Eastern Avenue near Romford.

### Tragedy of Strike

THE tragedy of the reductions is that although some thinning of London bus services would have been inevitable owing to the downward trend of traffic, nothing on this scale would have been required but for the disastrous effects on goodwill of the strike. Many passengers have been driven permanently to other means of getting about, just as Sir John Elliot, chairman of the London Transport Executive, warned the men before the stoppage began. Furthermore, nothing at all was gained by so inconveniencing the public; the Central men's arbitration award began later than it would have done had it been accepted at once while the Country and Green Line men, who had been promised a review later, have received just about what would have been granted in any event in the light of comparable increases to other workers. The 10 per cent drop in traffic on buses and trolleybuses means a loss in revenue to London Transport of about £5½ million a year. Working expenses will be reduced between now and the early part of 1959 by stages. The aggregate vehicle savings are expected to be as follows: withdrawal of certain Central bus routes and consequential variations to other services, 175 buses; withdrawal of Sunday extensions and resultant changes, 10 buses net; mileage reductions on Country buses, 30 buses; reduced services on Central buses, including closure of garages at Clapham, Old Kent Road and Putney Bridge, 350 buses; and mileage reductions on trolleybuses, saving 60 trolleybuses. The estimated reduction in gross working expenses is expected to amount to £3 million in a full year. The balance between this and the drop

trains to complete the re-equipment of the Piccadilly Line as reported on page 13 of this issue. The effect of this will not be confined to this line since delivery of the new stock will release cars which can be incorporated in Central Line sets to make them up to eight-car trains. This will reduce pressure on the available accommodation on that line in peak hours. For the Central Line, also, an order is to be placed shortly for 12 prototype motor cars with underfloor equipment, each bogie having two motored axles. Their design will be the result of a special study now being made to determine the most satisfactory form of tube car construction and equipment for this particular service. The 12 motor cars will be used with 12 rebuilt trailer cars to make up three eight-car trains for trial purposes. If the trials are successful, it is intended to equip the Central Line with trains of similar formation to the prototypes, that is, made up of new motor cars and rebuilt trailer cars in equal numbers.

### Plan to Accelerate Re-equipment

THIS process will accelerate the re-equipment of the Central Line by reducing the number of new cars to be built. Except for 15 postwar trains and the three prototype trains of 1957 all the Piccadilly stock will now be renewed and the seating capacity of each new train will be 15 per cent greater than those replaced. The Piccadilly Line's new trains will include fluorescent lighting, rubber suspension and—visible sign of change—unpainted aluminium alloy panelling. The Metropolitan-Cammell organisation is planning delivery from September, 1959, at the rate of four cars a week. The order for 532 cars is the largest single order placed since the war for passenger rolling stock; the same company provided 700 cars of the 1938 stock. The order for new Metropolitan Line stock (described in our July 26 issue) has not yet been placed, but equipment is being ordered for it. The

General Electric company, for example, is providing 760 80.5-h.p. motors for the Piccadilly Line and at least 446 of 69.5 h.p. for the Metropolitan Line.

### Report on the Dock Pay Dispute

THE court of inquiry which, under the chairmanship of Lord Cameron, has been examining the pay dispute between the port employers and the workers' unions published its report last Tuesday. It contained some vigorous criticism of both parties to the dispute. It is apparent that the court felt the attitude of the employers was not as flexible as it should have been. The consequences of a docks pay increase to industry in general were "stated rather than argued" and the court concluded that the employers' case for the refusal of any sort of increase was not established. The unions quoted figures of basic rates but the employers produced figures of actual earnings. These showed that over the past year dock workers' pay had fallen appreciably. Meanwhile the retail price index had risen and the employers did not suggest that there had been any fall of productivity in the period. The workers' case received less consideration than it deserved and the completely negative attitude of the employers was not justified by the arguments offered to the unions or the court. It would have been very much better if the unions had put forward a figure instead of a vague phrase about "a substantial increase" and for that matter, the employers should have pressed for a definite figure. Both sides failed to explore the extent of their differences and did not take up all the possibilities of securing agreement. There was a regrettable failure to make use of the National Joint Council's power to refer a dispute to arbitration. The effects of a dock strike would be lamentable and the court, with studied diffidence, puts forward a figure of 7s. 6d. a week as that around which negotiations might be resumed. An approach has already been made for resumption of the wage negotiations.

### The Late Arthur Moss

THE death earlier this month of Mr. Arthur Moss just over two years after his retirement from the position of signal and telecommunications engineer of the Eastern Region, British Railways, removes from the scene one of the pioneers of modern signalling. He and Mr. Charles Carslake were assistants to Mr. A. F. Bound in the early years of this century when the latter was busy introducing power signalling on the old Great Central Railway. All three have now passed over, but their achievements in this field of railway engineering, whose full significance they did so much to encourage and demonstrate, will long be remembered. Moss's ability and accomplishments were recognised by his appointment to chief officer rank in the Eastern Region on nationalisation in 1948. From 1926 to 1943 he had been responsible, under the company's engineer, for the signalling department of the L.N.E.R. in Scotland, and for five years thereafter was assistant to engineer (signals) at Kings Cross. Among the several works carried out under his supervision were the installation of multi-aspect colour-light signalling between Glasgow and Kelvinhaugh, the re-signalling of Edinburgh Waverley, completion of the Doncaster re-signalling scheme, and re-signalling in connection with the Liverpool Street—Shenfield electrification. A day out with Arthur Moss on a signalling project in contemplation or execution was bound to be a great delight to the participant. Also he was responsible for the ground installation of the a.t.c. experimental equipment between Kings Cross and Grantham. He was a genial and popular figure in railway and manufacturing circles and a pillar of strength to the Institution of Railway Signal Engineers, of which he was a member of council from 1933 until elected a vice-president in 1946; he served as its president for 1948-49. He was a member of the Institute of Transport.



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*The Editor is prepared to consider contributions offered for publication in MODERN TRANSPORT, but intending contributors should first study the length and style of articles appearing in the paper and satisfy themselves that the topic with which they propose to deal is relevant to editorial requirements. In controversial subjects relating to all aspects of transport and traffic this newspaper offers a platform for independent comment and debate, its object being to encourage the provision of all forms of transport in the best interests of the community.*

**Railbuses**

NO fewer than three of the five types of railbus with which British Railways is to conduct experiments were on view for the first time last week, which might have been called "railbus week" in the British Transport Commission's modernisation plan. A description, with illustrations, of the three latest vehicles begins on the opposite page. They comprise the Park Royal type, which went to work on the London Midland Region from Bedford on August 11; the Bristol-E.C.W., produced by the British Transport Commission's Tilling group manufacturing companies for the Scottish Region, and which was shown at Marylebone on August 14; and the Wickham, which was running acceptance trials during the week between St. Margarets and Buntingford. Almost simultaneously the first of the A.C. railbuses destined for Scotland crossed the Border and has since been demonstrated at Gleneagles, while on the Eastern Region the German-built W.M.D. cars have been in service since midsummer. They work between Audley End and Saffron Walden and have also operated from Witham to Braintree and Maldon, but the traffic on the latter branch increases steeply in the summer season and larger railcars have taken over for the time being. The choice of the builders for these light and economical units seems ingenious—the A.C. company, uninhibited by previous railways experience except for the modern electric trains on Southend Pier; Bristol and Eastern Coach Works, with a wealth of bus constructional experience; Park Royal, builders of successful diesel railcars since 1933 and postwar exponents of a three-coach set of four-wheelers; Wickham, well-known builder of a wide variety of light railway passenger vehicles since 1925; and W.M.D., able to incorporate basic principles found valuable in light German vehicles. This policy, which has produced several constructional forms, various engine and transmission arrangements, and different attempts at overcoming the problems of suspension, should result in the ideal vehicle being available if an extended programme is found desirable.

**Problem as Old as Railways**

PROBLEMS of railway traffic operating which have given rise to this notable railbus experiment are age-old. In the earliest days of railways branches were built which failed to justify the running of an engine and train to pick up the meagre passenger business. In 1847 J. Samuel and W. Bridges Adams built a very small four-wheeled steam car with a vertical boiler for branch-line work; a larger 7-ft. gauge unit, *Fairfield*, served the Tiverton branch of the Bristol and Exeter Railway; and in 1849, the *Enfield* emerged to carry up to 42 passengers between that town and Angel Road on the Northern and Eastern Railway's main line. The full cycle was experienced of mechanical troubles, enlargement of the unit to cope with traffic demands, and units built speculatively by manufacturers who then found no outlet for their efforts. In general railways stuck to short steam trains and bore losses on operation with gritted teeth or went right back, as at one time between Port Carlisle and Drumburgh or as at Fintona until the very end, to employment of a horse-drawn coach for the few passengers that presented themselves. Keen analysis of the situation caused *The Times* in 1858 to put the blame for poor railway results in 1857 fairly and squarely on the multiplicity of branch lines which did not pay:

"During the last half-year, north, east, west and south, near and far, there is the same 'beggarly account' of empty carriages. The thought that most frequently occurs is, 'How can this possibly pay?' A train carries 10 passengers, three first-class and seven second, from a country station to a junction 15 to 20

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**AUGUST 23, 1958**

miles off—how can it pay? Go by it next week, the week after, and the next—beautiful weather, convenient hours—it is much the same story; better one day, worse another. From the junction it proceeds with more carriages, stops at a station, puts down one passenger, takes up two others; can that pay? A long train comes up to town, rich with the contribution of near a dozen branches. Count the passengers as they get out at the terminus in town. There are just 40 of them; can that pay? The truth is, we have accomplished a magnificent object. We have produced a work which Nimrod, or Nebuchadnezzar, or Nero would have envied. . . . But we have done more. We have so filled these isles with iron roads that everybody can go almost everywhere, and have his choice of lines."

**The Railcar Era**

BAFFLED by these circumstances, but rewarded by better main-line traffics, the railways accomplished little by way of either pruning or modernisation until stimulated many years later by electric tramway competition, when Dugald Drummond, of the London and South Western Railway, designed a self-contained steam railcar for the Fratton—East Southsea branch in 1903. Several companies built similar cars in the next few years, but Drummond by 1906 had seen the defects of the inflexible little vehicle which had to be replaced by an orthodox train whenever the motive unit was on shed for maintenance. So the L.S.W.R. introduced the motor-train or auto-train, at first with a specially designed small locomotive, for use either on the light traffic branches or on lines where greater frequency could counter tram or bus competition. Many railways (and the L.S.W. later) were content to use older locomotives on these one- or two-coach trains which, because of their reversibility without running round, were eventually termed push-and-pulls. The coaches had to be specially adapted to have driver's cabs and control gear at the outer ends; sometimes, as at Plymouth on the G.W.R., where three coaches were marshalled either side of the engine, the push-and-pull locomotive itself was camouflaged as a coach. The difficulty of making ends meet on very light traffic lines was still not tackled; the internal combustion engine gave a ray of hope, but tinged with much disappointment. The Freshwater, Yarmouth and Newport had a 12-seat Drewry car for special parties in 1913; a later Drewry, with 30 seats and power to haul a trailer, flourished on the Weston, Clevedon and Portishead from 1921 onwards. After an attempt with a four-wheeled Pickering geared steam car in 1906 on the Kent and East Sussex, Colonel H. F. Stephens adapted Ford petrol buses, coupled back to back to save using special reverse boxes, but in general road vehicles have had little success on rails, presumably owing to the destructive effects of high-frequency vibration. The Sentinel steam wagon units used in railcars from 1923 onwards evolved, however, into very useful vehicles, save that their capacity did not allow for the wide fluctuations of railway work.

**Possibilities of the Small Cheap Unit**

THE multiple-unit diesel railcar, which itself has evolved rather slowly over a quarter-century, and not without its setbacks, is now well established as a vehicle that appeals to modern taste, can give swifter service and can deal with overloads either by accepting standing passengers till the springs are flat or by adding further units to the train, if they are available; by these characteristics and its reliability it has brilliantly outshone its predecessors among small units. It offers considerable economy and yet with little adaptation it can replace steam suburban trains on duties where the time for electrification is not yet ripe. It might have been argued that nothing else is needed and that where traffics have fallen below the level where 120-passenger units are required it is easier to direct the small company of faithful rail travellers to the bus. The Commission has thought that a defeatist answer, despite its interests in the bus business; moreover, there are many cases where the inconvenience of the change (as on a link between two rail journeys) might deter the passenger from using the railway at all. So the cheap to buy, cheap to operate, small-capacity railbus comes into the picture. There is a good case for trying to work up traffic, on all but the most hopeless lines, by greater frequency and convenience of service and by stopping at highway crossings to pick up and set down passengers from ballast level without provision of platforms, especially where for historical reasons the old station sites are not in the centres of rural population. The retractable steps may yet be the key to success on many near-defunct branches. With the aid of the vehicle builders the latest railbuses, seating from 46 to 60 passengers, may achieve success where nothing else will. There may even be scope for them, with their low working expenses, as auxiliaries to the larger and more conventional units on various facilities. Special attention has been given to the promotion of good riding in these four-wheelers; a light eight-wheeler, as is popular in Denmark, would have made an interesting comparison, but would probably involve higher costs. With our dense network of competing bus services financial results may not be as spectacular as in Scandinavia or Germany, but the attempt is deserving of goodwill and a fair trial.

[Forthcoming Events appear on page 5]



# RAILBUSES ON BRITISH RAILWAYS

Five Types Now in Experimental Service

## ECONOMICAL UNITS FOR LIGHT TRAFFIC ROUTES

ALL five of the types of four-wheeled railbus ordered by the British Transport Commission for experimental service on British Railways have now appeared; last week saw three Park Royal units go into service from Bedford on the London Midland Region on Monday, acceptance trials of the first of the Wickham batch, and an inspection at Marylebone of the Bristol-E.C.W. type built by two companies of the B.T.C.-owned Tilling bus group. It will be recalled that the first of the

special coil spring layout is a self-contained four-wheeled running unit lacking only controls and certain other minor items.

The complete vehicle suspension—which also includes the axlebox springing and is designed under a B.U.T. licence—together with seating designed to combine the requirements of maximum seating capacity with the greatest comfort ensures the smoothest ride possible. British Railways standard design of diesel railcar steel disc wheels and axles are used, the wheels being of 3 ft. dia. The special double-row spherical roller-bearing axle-

Railways service. The drive from the box is transmitted by cardan shaft to the B.U.T. final drive unit, axle mounted, which incorporates the forward and reverse gearing. The final drive ratio is 3.36 to 1 and the gearbox ratios are 1st, 4.28 to 1; 2nd, 2.43 to 1; 3rd, 1.59 to 1; and 4th, 1 to 1.

Engine cooling is effected by a side-mounted radiator unit with ducted fan, shaft driven by a right-angle drive unit on the engine. The system is pressurised by means of a two-compartment header and expansion tank mounted in the body with flexible hose to the radiator top feed pipe. A low water shut-down switch is incorporated in the tank to guard against cooling water loss, and the pressure retaining filler cap is recessed into the body side. A low oil pressure switch is also included, to shut down the engine in the event of a serious drop in oil pressure.

### Control Equipment

A manual throttle control is mounted to the solebar beside local control "start and stop" buttons, to enable air pressure to be built up to the required degree for the driver's controls to become operative. Electro-pneumatic control, of B.U.T. design, is used for the engine and transmission, employing high-pressure (80 lb. per sq. in.) e.p. valves for throttle motor and forward and reverse control, and low-pressure (65 lb. per sq. in.) e.p. valves for gear selection and the deadman's control. The throttle controller, incorporating the hold-down deadman's device, provides for four throttle positions and idling, while the gear selector control is inter-connected with the forward and reverse key to prevent engagement of a gear when the final drive is in neutral, or operation of the direction control when a gear is engaged.

With a capacity of 200 amp. hr., N.I.F.E. 24-volt alkaline batteries are mounted in two battery crates, one each side of the underframe, and insulated therefrom. The charging equipment is a C.A.V. alternator with germanium rectifier and voltage-control unit. The alternator provides 30 amp. output at idling speed and 50 amp. maxi-

VS automatic control system. Gear engagement is by air-pressure, controlled by Westinghouse electro-pneumatic valves operating in response to signals from the VS control.

The control system has been evolved by Bristol Commercial Vehicles in collaboration with Westinghouse and Self-Changing Gears. Westinghouse pneumatic equipment is used for throttle and brake controls and for gearbox operation. Transmission control is fully automatic from standstill to maximum speed. Driving controls (duplicated at each end) have been reduced to a minimum and made very simple in action. A single removable master control key only is used. The controls consist of accelerator lever incorporating the deadman's handle; air brake lever; horn lever; handbrake lever; and direction lever for forward and reverse motion selection and engine stopping and starting, governed by the master removable key. The whole driving technique can be mastered within about 10 min.

### Dunlop Monitor Disc Brakes

The brake equipment is laid out on the Dunlop Monitor system in which a beam carrying a monitor shoe is pivoted on two vertical links; these in turn pivot about their mounting brackets. An air operating cylinder is positioned in one vertical link which brings the monitor shoe into contact with the wheel rim, thus causing the vertical links and beam to swing in the direction of wheel rotation.



Park Royal railbus in Hitchin bay at Bedford; right, Wickham railbus on acceptance trials at Buntingford

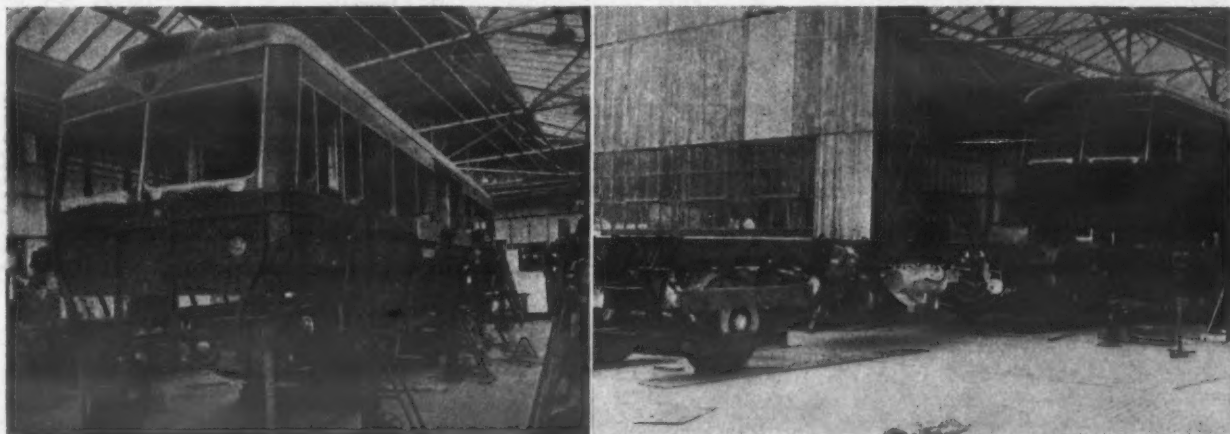
22 vehicles was built by A.C. Cars, Limited, and was described and illustrated in our February 22 issue. The German-built W.M.D. railbuses, with 150-b.h.p. Büssing engines, were next in the field and were the subject of a description in MODERN TRANSPORT of June 14 last.

### Variety of Designs

To give the greatest variety of designs for the present series of units, which will undergo extensive practical trials in service, wide latitude was allowed the various makers in their methods of overcoming the problems involved and covering basic requirements. As a result

boxes used do not embody horn guides, but are located entirely by the side bearing spring, the box incorporating only safety guide lugs working in conjunction with the guide plates on the underframe in the event of spring failure.

The side bearing springs, longer and with a slower rate than is ordinarily used on railway stock, have a solid buckle shrunk on and secured by wedges over the spring leaf centre locating dimples. The buckle is clamped below the axlebox by a separate cap secured by four high-tensile studs and nuts, and is located in box and cap by pegs. The spring is anchored by an eccentric pin at one end, the other end bearing against a case-hardened guide and wearing plate to allow spring movement



Body for Bristol-E.C.W. railbus being lowered on to chassis by jacks at Eastern Coach Works, Lowestoft; the Bristol railbus chassis prepared for body mounting; right, the complete Bristol-E.C.W. unit

the Park Royal vehicle, which embodies many features standard with multiple-unit eight-wheeled railcars, weighs 15 tons and has a 150-b.h.p. 11.3-litre type A B.U.T. horizontal diesel engine; the Bristol-E.C.W. railbus has an unladen weight of 13½ tons and is powered by a Gardner 112-b.h.p. 6HLW engine, while the Wickham car, with a tare of 11½ tons, gives a satisfactory performance with a Meadows six-cylinder horizontal engine producing 105 b.h.p. at 1,800 r.p.m.

The Park Royal railbus relies on a welded steel main underframe for strength, carried on laminated and coil springs designed under a B.U.T. licence; the Bristol-E.C.W. has fully integrated underframe and body to form a robust structure, resilient wheels and rubber suspension are used; the Wickham body is coupled to the underframe of square tubular sections by Metalastik Cushyfoot rubber sandwich mountings. The primary means of suspension on the Wickham vehicle is by leaf spring with rubber blocks between spring ends and body supports. The Park Royal has a Clayton Dewandre air brake system; the Bristol-E.C.W. has an original Westinghouse-controlled arrangement incorporating the Dunlop Monitor brake system, providing for air-hydraulic operation of disc brakes at each wheel; there is a bus-type handbrake of considerable power which, with the servo action of the discs, can provide satisfactory braking should the air supply fail. The German cars employ an electro-mechanical gearbox, those built here have self-changing type boxes, but whereas most employ a fluid flywheel the Wickham cars have the Wickham Freeborn centrifugal clutch.

### Allocation

The 22 railbuses for British Railways are being allocated to the Eastern Region (5), London Midland (3), Scottish (10) and Western Region (4). They are being built by A.C. Cars, Limited (5), Bristol Commercial Vehicles, Limited (2), Park Royal Vehicles, Limited (5), Wagon und Maschinenbau G.m.b.H., Donauwörth, Germany (5), and D. Wickham and Co., Limited, of Ware, Herts (5). A description follows of the latest units.

As stated, three of the Park Royal vehicles are based on Bedford, L.M. Region; the other two are destined for Scotland. The vehicle is built as two substantially separate portions, the power underframe and the body unit, these being assembled together when each is almost a finished unit. The interior layout of the saloon seats 50 passengers and provides the greatest possible luggage and standing space in the centre. The power underframe from which the body is suspended by the

on deflection. This layout provides positive location of the axle and box while allowing a soft ride to be obtained by the elimination of all but interleaf friction within the spring layout. Wheelbase and other dimensional adjustments to the axles are achieved by the use of the eccentric pins, and by providing slight lateral adjustment to the end guides, braking and acceleration forces being taken through the eccentric pin.

### Brake Gear

Orthodox clasp type brakework is used, with fully compensated rigging, each axle set being mechanically independent. B.R. pattern brake blocks and permanent heads are used for ease of replacement from stock, and adjustment is by means of conventional stepped-hole adjuster plates. The main cross shaft of each axle set is operated by one direct acting air-pressure cylinder, linked to the lever by a yoke to permit movement of the cross shaft by the handbrake. Lever type handbrake controls are of the drum type, giving multiple pull operation in the event of wear in the system, but with quick and complete release in one movement. Both handbrake levers are connected by flexible heavy-duty cable to a cross lever on the underframe to permit free movement of body in relation to frame; the cross lever is in turn linked to each brake operating cross shaft, allowing either handbrake lever to operate all brakes.

The Clayton Dewandre direct-acting air brake system incorporates automatic control in the event of air system failure. Twin 6-in. diameter brake cylinders are used, one to each axle set, connected via relay valves to the train pipe. The relay valves' principal function is in the event of air-pressure failure, when separate emergency reservoirs, one for each axle set, are brought in for brake application. These reservoirs are at all other times charged from the main reservoir and isolated by the relay valve. The driver's brake valve is of the progressive type, the distance the handle is moved towards the applied position determining the train pipe pressure. A deadman's handle and a passenger emergency valve are provided. The first operates through a 6-sec. delay device from the throttle control, and in addition to the brake application, the engine returns to idling and the gearbox to neutral. The second is a simple cock in the vestibule which admits air pressure direct to the train pipe, and is non-resetting, requiring operation of the release cord to reset. The reciprocating compressor is a Clayton Dewandre PC6a31-6 type.

### Power Unit and Transmission

The engine is the B.U.T. 150-b.h.p. A-type 11.3-litre six-cylinder unit, with 20-in. fluid flywheel driving through a free wheel to the Self-Changing Gears R14 type four-speed epicyclic gearbox. Control, power and transmission on the Park Royal railbus is indeed similar to that of about 1,000 of the 1,050 multiple-unit railcars so far in British

multiple-unit stock in operation with British Railways. Body suspension and layout will be the subject of subsequent reference.

Graviner automatic fire extinguishing equipment is provided, the spray ring covering the complete engine installation. Should the local temperature rise operate the system, the engine is automatically shut down and a warning bell operates in the



London Midland Region railbus based at Bedford traversing crossover at Shefford; right, the first diesel railbus to enter Scotland, an A.C., photographed at Gretna with Mr. C. Ross Campbell, motive power superintendent; Mr. G. E. W. Stewart, assistant general manager; Mr. James Ness, general manager; and Mr. M. G. Maycock, chief civil engineer, Scottish Region

driver's cab. This installation follows that used on multiple-unit stock in operation with British Railways. Body suspension and layout will be the subject of subsequent reference.

### Bristol Mechanical Portion

The engine of the Bristol-E.C.W. railbus is a Gardner six-cylinder diesel unit of type 6HLW. It is of 8.4 litres capacity and gives 112 b.h.p. at 1,700 r.p.m. The maximum torque is 358 lb./ft at 1,300 r.p.m. It is flexibly mounted amidships below the body floor. The transmission is through a Self-Changing Gears 18-in. fluid flywheel unit incorporating a centrifugal lock-up clutch to provide a positive drive at speeds above 700 r.p.m. Drive from clutch to gearbox is through a short cardan shaft embodying a free-wheel unit. The Self-Changing gearbox of type R11B gives five speeds, including an overdrive with ratios of 4.07 to 1, 2.42 to 1, 1.6 to 1, 1 to 1 and 0.77 to 1. The gearbox is arranged for fully automatic gear selection and engagement by the Self-Changing Gears

driver's cab. Pad clearances with brakes off are automatically maintained at a constant amount—no adjustment is necessary. Pads are changed when fully worn by removal of a split pin and nut, allowing the carrier plate to be withdrawn—calliper arms are then opened by the tool provided and the new pads secured in position. The monitor shoe is retained by a pin and a split cotter; bearing pin bushes are of the oil-less type and do not require lubrication. Hydraulic fluid levels require to be maintained within the sight level aperture. Bleeding of air from the hydraulic system is from a single point provided on the upper side of each calliper cylinder.

### Axles and Suspension

The single driving axle case is a Kirkstall pot type steel forging carrying the double reduction final drive unit. The driving axle is similar to a bus or heavy lorry axle, except that it has no differential. There are two spiral bevels for forward

(Continued on page 6)



## LORRY—BUS—COACH

## School Transport in West Kent

WEST Kent educational authorities have decided to change over from rail travel to coach for children who attend schools in Tonbridge from the outlying towns of Cranbrook, Hawkhurst and Sandhurst and villages in those areas. Thereby they will save £1,500 a year. They have come to this decision for a variety of reasons. These include the desirability of reducing the length of the school day as many children have to leave home very early in the morning; the need to simplify the journey as far as possible—some children at present travel by taxi or coach to and from a railway station, journey a short distance by rail, then change trains, and on arrival at Tonbridge are still a considerable distance from school.

Then, too, they say, there are the pupils who live reasonably close to road pick-up points, who are at present conveyed to railway stations. There is a sound reason, the educational authorities point out, to look closely at the cost of taxis and coaches used by them. The bus operator approached is willing to co-operate in making the departure times of vehicles after school as flexible as possible.

## Responsibility for Shelters

FACED by so many requests for the provision of bus shelters, Southdown Motor Services, Limited, can no longer take the responsibility of erecting them. Slaugham (Sussex) Parish Council, which wanted a shelter at Pease Pottage, has been told that Southdown would be prepared to consider contributing a percentage towards the cost of shelters but not their maintenance.

## Plan to Save Bristol Works

LOCAL representatives of the T. and G.W.U. will meet officials of Bristol Commercial Vehicles, Limited, during the next fortnight in another attempt to prevent its Kingswood works being closed by Christmas. The Ministry of Supply says it can do nothing, and that any possible action to save it must be done locally (the works have been engaged on M.O.S. contracts, now to be discontinued). The 200 men at the works, who have been on short time since March, are now back on a five-day week.

## New ARTCO to Decide Policy

THE new company, Associated Road Transport Contractors, Limited (limited by guarantee), has now been formed, and a meeting will be held in London on September 30 in order to arrange future policy. Long-distance hauliers who desire to join the new ARTCO (which will be conducted on association lines) will be invited to attend this meeting. The venue and time of meeting has not yet been finally arranged. It is hoped that it may be possible to approve the final winding-up of the old company, whose title is now changed to Transport Associates, Limited, on the same day. The September meeting will be under the chairmanship of Mr. H. L. Walker, since at a recent meeting of the directors of ARTCO, Mr. M. W. Harris resigned his position as chairman. He

felt that as he had held it without a break since ARTCO's inception in 1945, the time had now come when the office should be passed on. It was announced in February that ARTCO was to be reconstituted on a non-profit making basis, to be run "rather on the lines of an association." This would presumably put it on a footing similar to the rival Transport Association.

## Prospects of African Companies

NET profits of the African Transport Co., Limited, the East African holding company whose shares are held by the United Transport Co., Limited, and the B.E.T., fell appreciably in 1957.



One of 20 Sunbeam trolleybuses with M.C.W. 62-seat bodywork in course of delivery to Bournemouth Corporation Transport Services. Two doors are fitted

from £168,000 to £121,000 after tax, states the report of United Transport. This was principally due to high allocations for depreciation, taxation and loan interest. The profit came from the passenger services; motor trading companies suffered a marked fall in that respect. Rhodesia United Transport, Limited, had a net profit after tax of £232,720 (£151,420); passenger and freight companies contributed to gross revenue in roughly equal proportions. The subsidiary Central African Road Services, Limited, is now linking terminals as far apart as 2,700 miles with its freight services. Individual companies, however, have had varying fortunes and all are not even yet at a profitable stage. Jamaica Omnibus Services, Limited, found it difficult to maintain profits.

Canadian Motorways, Limited (long-distance haulage), another company in which an interest is held, actually a B.E.T. subsidiary, suffered a loss of £124,537 due to the general recession and satisfactory profits are not expected until the task of reorganising the 16 subsidiary companies forming

this group has been accomplished. Developments in many Commonwealth countries provide almost unlimited opportunities for British enterprise and capital, says the chairman of United Transport, Mr. Guy Bown, but he warns that financial measures here, such as changes in Bank Rate, credit control, inflation, etc., have immediate and similar repercussions in the Commonwealth. Net group profit for 1957, after tax, was £145,920 (£131,227), and dividend on the ordinary shares is raised from 10 to 12½ per cent. Mr. W. T. James, a B.E.T. director, has joined the United Transport board.

## Goods Vehicles in Meter Zones

COMMERCIAL vehicle drivers are being warned that double-banking will not be tolerated in streets embraced by the north-west Mayfair parking meter scheme. Mr. R. E. G. Brown, London secretary of the T.R.T.A., has been informed by Westminster Council that some drivers engaged

mechanical horses. The trolley is being used successfully at Glasgow parcels branch.

## New Bristol Bus Station

CONTRACTORS engaged on the £200,000 bus garage-cum-station at Whitson Street, off Lower Maudlin Street, Bristol, are expected to finish work there on August 30, and services will begin operating from it on September 21. The official opening date will be later. The new station is for country buses, but its opening will signalise the complete reorganisation of city routes.

## C.N.R. Looking at Road Haulage

UP to the present, the Canadian National Railway had "not been too sold" on the idea that it could make money on road haulage operations, said the C.N.R. president, Mr. Donald Gordon, before a House of Commons committee in Ottawa last month. However, he added that their views were changing and they might go in for more. He would neither confirm nor deny reports that C.N.R. was in negotiations for road trucking companies.

## Financing of Ceylon Bus Purchases

ACQUISITION of a further 100 second-hand double-deck buses from London Transport is being negotiated by the Ceylon Transport Board, it is reported, but London Transport has requested a guarantee from the Ceylon Government that the Transport Board, in financial difficulties already, will meet the bill. There has been a certain amount of reluctance on the part of the Government to give this guarantee. A similar guarantee has been asked by manufacturers from whom vehicles are purchased. They are prepared to extend credit facilities to the Board but insist on Government guarantees.

The Transport Board has made another desperate appeal for funds to carry on its business. The chairman of the Board, Mr. Vere de Mel, says that on nationalisation the Board took into service 15,000 employees whose wage bill in January, 1958, exclusive of overtime, amounted to Rs.1,760,000. In February it decided to offer a slight increase of wages. At the same time a single consolidated rate of wage was introduced. This naturally increased the wages bill per month. In March an Industrial Court awarded certain categories of workers a general increase of wages. This cost the Board a further Rs.300,000 per month. In April the trade unions demanded an increase of wages amounting to Rs.1 million. The Board faces today the situation where it is unable to make good the extra Rs.1 million let alone place any revenue to reserve. A spokesman said that it would not be able to incur any further capital expenditure unless the Minister of Finance decided to release the money the Board has requested.

## Bus and Coach Developments

R. A. Macleod, Inverdale, proposes a daily service thence to Poole via Naust.

From August 18 Corona Coaches, Limited, took over the operations of E. F. Long, trading as A. J. Long, at Glemsford, Suffolk. Mr. Long has joined the Corona board.

The remaining trolleybus routes of the South Lancashire Transport Company are to be withdrawn on August 31. The replacing buses on the three routes, Leigh-Atherton-Bolton, Atherton-Swinton-Farnworth, and Leigh-Mosley Common, will from September 1 carry route numbers 82, 83 and 84 respectively. 82 being jointly operated with Bolton and Leigh Corporations and 84 with Leigh Corporation. It will now be possible to book right through from Leigh to Bolton instead of having to re-book at Four Lane Ends now that the service is to be a joint one.

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man

Thirty years, I've driven ambulances and hospital 'buses and I know the value of a 100% dependable vehicle. At the best of times, a breakdown may be serious—at the worst of times, it doesn't bear thinking about. Experience has taught me that Morris feel as I do . . . reliability matters most of all.

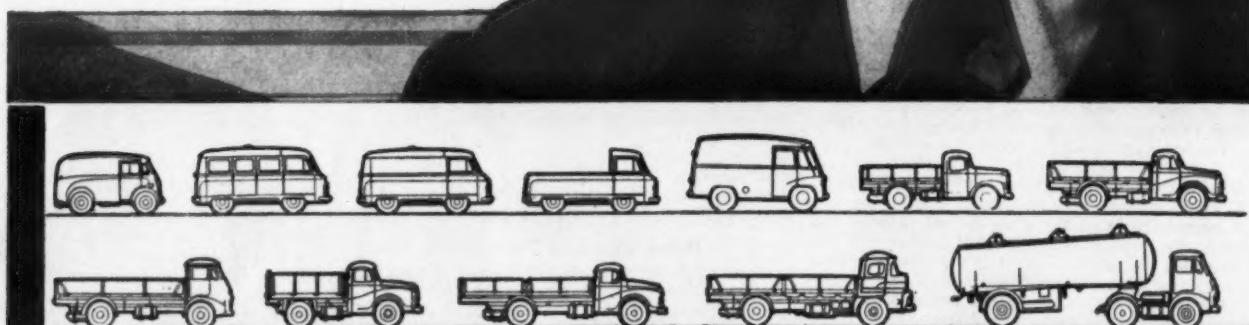
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## PLASTICS COACHWORKS

Complete Switch to New Materials

AT THE JAMES WHITSON WORKS

**N**OTWITHSTANDING the advances that have been made in glass fibre-reinforced synthetic resins and a growing acceptance of these new materials in motor vehicle bodywork, it was a bold decision on the part of James Whitson and Co., Limited, to switch the whole of the production capacity of its Yiewsley works from conventional bodybuilding materials to structural plastics. Certainly, the present capacity is largely given over to the production of the all-plastics body of what promises to be a popular new private car but a recent visit to the works revealed also a quite lively activity in commercial vehicle work, principally in moulding plastics bodies for milk-delivery vehicles and cab components and wings for

All the glass fibre material, which in the main is Fibreglass with some Deeglass, used in the production of both moulds and mouldings is cut to shape in the cutting shop, which maintains a small stock replenished as necessary from the general store. For production of the moulds, the formers are treated with a release agent before building up with successive laminations of glass fibre and resin until the required thickness to form a rigid mould, which varies with the size and shape, has been obtained. The larger moulds are removed from the formers after 48 hr. and then stood for 10 days at 65-70 deg. F. while smaller moulds are oven treated at 120 deg. F. for 24 hr. in an adjacent hot room and then get the same standing period as the larger pieces.

### Resin Mixing

In the resin-mixing shop, Cellobond polyester resin and the various other ingredients, including colour when required, but excluding the catalyst, are mixed usually in 5-gal. batches for 3 to 4 hr. in a paddle mixer. The mixture is generally allowed to stand overnight to allow most of the entrapped air to escape and working lots of 7 to 10 lb. are drawn by the moulding shops as required, the catalyst being added immediately prior to use. To produce the mouldings, the moulds are first treated with a basis of wax and an application of release agent, followed by a gel coat of Cellobond which is allowed to set for up to 2 hr. depending on size and complexity. A coat of lay-up resin mix is next applied followed by a layer of 1½-oz. glass mat. More resin is added and thoroughly worked in the glass fibre by means of hand rollers.

For most mouldings a second layer of 1½-oz. mat with resin as required suffices, but at points in any moulding requiring extra strength additional layers of glass mat up to a total of six are incorporated. Offcuts from the cutting shop are employed for this purpose, thus providing a use for small pieces of glass mat and reducing waste. Some mouldings for particularly arduous duty require different treatment. For example, floors for milk floats produced by Whitson for Mickleover Transport have steel channel bonded into the moulding and 4½-oz. glass mat and a lay-up mix containing a special B.R.P. hardener are used.

### Curing

Completed mouldings are kept in their respective moulds overnight and removed first thing by the morning shift. Large mouldings are stood for 10 days at 65-70 deg. F. while smaller parts are oven treated for 24 hr. at 120 deg. F. All mouldings are trimmed in the separate cutting shop, which is equipped with electric hand machines specially developed for the purpose. In the main inspection shop, all mouldings are inspected for bubbles and crazing and affected parts are cut out and remade with polyester-glass materials. Colour-impregnated mouldings are examined also for dust spots, which are removed and touched in with coloured gel coat.

During a recent visit to the Yiewsley works, there was great difficulty in the inspection shop in finding faulty mouldings to illustrate these common imperfections, providing evidence of the high standards achieved. Indeed, having followed closely the pro-



Mixing the Cellobond resin and other ingredients in a paddle mixer, two of which have been made up in the works from ordinary pillar drills and boat's propellers

Scammell Lorries, Limited, as well as streetlighting lamp units and non-corroding tanks and parts for water-chlorination plant.

### Long Experience

Mr. A. E. Whittit, chairman and managing director of James Whitson and Co., Limited, the largest privately-owned coachbuilding business in the country, has had 45 years' experience in coachbuilding, having served with such well-known concerns as Northern Counties and Dennis Bros., and his present company over the years has produced the bodywork for thousands of coaches, M.O.S. vehicles, fire engines and so on, so it would appear that the decision was not lightly taken nor without a thorough knowledge of commercial vehicle operator requirements. In fact, the long experience of the company and of its chairman should be a guarantee that the occasional mistakes made by early producers of plastics mouldings will be avoided



Commercial-vehicle mouldings produced by James Whitson include United Dairies milk-float bodies for Mickleover Transport, cab fronts and a roof of which are shown, and Scammell cabs, a main pattern and polyester-glass mould for which are seen on the right



in the Whitson products and that the acknowledged advantages of reinforced plastics for coachbuilding will be exploited to the full. A further guarantee is that the Whitson company is backed by the experience and technical resources of British Resin Products, Limited, whose Cellobond resin is used exclusively in Whitson polyester-glass fibre mouldings.

The Whitson factory at Yiewsley, Middlesex, disposes of some 84,000 sq. ft. of permanent buildings (now being increased by new building to 92,000 sq. ft.) of which about 36,000 sq. ft. is devoted to the actual production of polyester-glass mouldings, the remainder being taken up by material stores and assembly, finishing and inspection departments. Since April, 1957, when the company first started production of plastics mouldings, a pattern has been evolved to gain a smooth production flow and the buildings used for the moulding processes have been adapted to conform to the prime requirement for successful moulding—the maintenance of an even temperature of 65 to 70 deg. F.

### Mould and Moulding Production

The technique employed is the hand-layup method in moulds first produced in the works of polyester-glass fibre on formers of wood, metal or plaster, depending on the nature of the mould. The overall layout embraces separate glass fibre cutting shop, mould-making shop, resin-mixing shop, several moulding shops for different components and a cutting shop where the cured mouldings are trimmed. The moulding area has been planned for progressive flow of parts through the shops and after curing and trimming they go through a main inspection shop before being passed to the assembly and finishing departments. Both natural and colour-impregnated mouldings are produced, the natural mouldings subsequently being finished in the colour required by spraying. Early paint-adhesion troubles on reinforced plastics seem to have been overcome and the material now used by the Whitson company—Valentine's Sprayglass, a mixture of cellulose and synthetics—has been specially developed for the purpose and is said to give first-class results.

gress with structural plastics in coachbuilding and inspected most of the establishments now producing mouldings for commercial vehicles, we were greatly impressed by the very high standard of finish of the mouldings turned out at Yiewsley and by the high production rates achieved. The careful planning and orderly flow that have produced these results are not however the end in the search for a more economic productivity that will widen the field of employment of polyester-glass fibre mouldings. James Whitson and Co., Limited, is already working on developments aimed at speeding up the moulding process among which are mechanisation of the lay-up process and the incorporation of heating elements in the moulds.

### Forthcoming Events

- August 23.—Omnibus Society. Visit to L.T.E. Neasden railway depot, 10 a.m.
- August 24.—Omnibus Society (Northern). Visit to Northern General Transport Co., Limited. Meet Chester-le-Street depot, 2.15 p.m.
- Light Railway Transport League. Visit to Grimsby and Immingham Light Railway.
- August 30.—Light Railway Transport League. Paper by Mr. R. L. P. Atkinson, "The Calcutta Tramways." At 153 Drummond Street, N.W.1. 3 p.m.
- August 30-September 6.—Norbury Transport and Model Railway Club. Tour of Isle of Man, Blackpool, Belfast and Dublin.
- September 1-7.—Society of British Aircraft Constructors. Flying display and exhibition. At Farnborough. (Public days September 5, 6 and 7.)
- September 2.—Railway Correspondence and Travel Society (Sheffield). Paper by Mr. J. F. Clay, "Fifty Years of Midland Performance." At 44 Union Street, Sheffield. 7.30 p.m.
- Permanent Way Institution (Leeds and Bradford). Paper by Mr. J. Nichols, "American Railroads." At B.R. Social and Recreational Club, Ellis Court, Leeds. 7 p.m.
- September 3.—Institute of Road Transport Engineers (Metropolitan). Visit to Vauxhall Motors, Limited, Luton. Institute of Road Transport Engineers (East Midlands). Visit to Hepworth and Grandage, Limited, Bradford.
- September 4.—Institute of Transport (Berks, Bucks and Oxon). Visit to London Airport. Meet 83 Lower Thorn Street, Reading. 2 p.m.
- September 5.—Railway Club. Re-enactment by Mr. K. G. Carr, "The Great Bristol Contest of 1835." At 320 High Holborn, W.C.1. 7 p.m.



### Emergency is the test of real efficiency

All the road safety precautions in the world cannot prevent an accident in a situation like this—but good brakes can! Ensure that your vehicle is equipped for all emergencies by fitting Clayton Dewandre braking equipment.

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AP 35



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## Railbuses on British Railways

(Continued from page 3)

and reverse, which are engaged by dogs operating from air cylinders. An interlocking device is fitted which prevents any movement of the vehicle until the dogs are correctly engaged. A manually operated neutral position is provided to allow the vehicle to be towed should it be necessary. The wheels on the trailing axle can revolve indepen-

The suspension of the railbus is by Metalastik rubber units in two stages. Each axle is attached to a sub-frame through two pairs of chevron rubber sandwiches, while the main structure is supported from the sub-frames by eight Metalastik rubber spring units, four at each sub-frame. In side elevation the axes of the spring units make an angle of 15 deg. with the horizontal and load is taken by the rubber in compression and shear. Damping is by separate vertical and horizontal telescopic hydraulic units and brake torque reaction links are fitted at both axles.

### Miscellaneous

The electrical equipment is based on a C.A.V. a.c. generator of type 824 2, feeding through a rectifier and control board to a 24-volt d.c. Exide battery of 296 amp.-hr. The alternator is driven by multiple V-belts from the front end of the gearbox at 2.8 times engine speed. The instruments to guide the driver include a thermometer for engine cooling water temperatures; an air-pressure gauge and a speedometer and mileage recorder. His windscreen wipers are of Trico type F.P.K. heavy-duty with a 70 deg. wiping arc.

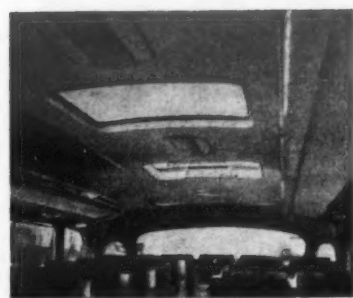
The Coventry radiator is of the flattened tube type, suspended below the vehicle floor between the engine and the trailing axle. Header tank and filler cap are at the side and accessible through an aperture in the skirt panel. The system has a capacity for about 10 gal. of coolant. A single 38-gal. fuel tank mounted below floor level at one end of the vehicle supplies both the engine and the Smiths combustion heater. To do away with measurement of the oil level by a dipstick, an engine oil dispenser has been fitted which automatically tops up the oil sump from a reservoir tank. A sight glass gauge is visible from the outside of the vehicle and the reservoir tank has to be filled up only occasionally. The E.C.W. bodywork of this interesting vehicle will be the subject of later reference.

(To be continued)

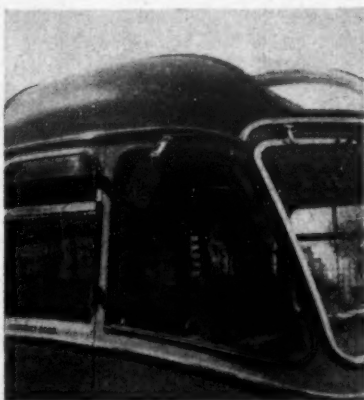


Model of the Dunlop Monitor braking system which has been applied to the Bristol-E.C.W. railbus

dently. Wheels are Svenska Aktiebolaget Broms-regulator resilient type, made in Sweden; rims are flexibly mounted relative to the wheel centres by a system of rubber bobbins, thus reducing wheel shock and noise when traversing rail joints, and special work. Wheels are detachable from the hubs, thus making for easy removal.



These photographs show curved roof canopies, curved rear windows and internally illuminated name plate and weatherguards made from 'Perspex' in a coach built by Duple Motor Bodies Ltd. The hinged roof ventilators are made from 'Perspex' by Weathershields Limited.



## 'Perspex' Is a good traveller

COACHES built by Duple Motor Bodies Limited contain a lot of 'Perspex' acrylic sheet. 'Perspex' is used for weather protection guards, roof canopies, hinged roof ventilators, engraved name plates and internally illuminated name plates, finger plates on seats.

'Perspex' owes its versatility to a number of outstanding features: above all, it is a material with which designers can effectively combine function and good looks. In addition, 'Perspex' stands up well to all kinds of weather without losing its attractiveness and is unaffected by atmospheric changes. It is long lasting, strong and shatter-proof. It has a high light transmission and is easy to clean and maintain. It is light in weight, an important consideration where so much is being used. Finally, when used for signs, 'Perspex' can be internally illuminated so that names can be seen as clearly by night as by day.

'Perspex' is available in a wide range of gay, pleasing, transparent, translucent and opaque colours as well as in clear and opal sheet.

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P.444

## MECHANICAL STOKERS

### Three B.R. 2-10-0 Class 9F Fitted

OVER the years railways have been confronted with the problem of increasing locomotive capacity and it is generally recognised that the power developed is limited by the physical effort of the fireman. Mechanical firing has received attention over a considerable period of time and has resulted in the development of several types of mechanical stoker. The fitting of stokers to locomotives is not necessarily dependent upon the size of grate but aims at obtaining maximum output from the boiler at all times regardless of the working of the locomotive and quality of fuel.

The Berkley stoker, which includes a number of novel features that have proved successful in operation in other countries, is not automatic and has to be intelligently controlled for efficient operation. It does, however, relieve the fireman of heavy physical labour. Three British Railways standard 2-10-0 Class 9 freight locomotives Nos. 92165, 92166 and 92167 recently constructed at the Crewe works of the London Midland Region have been fitted with Berkley stokers under the direction of Mr. R. C. Bond, chief mechanical engineer, British Railways Central Staff.

### Layout

The stoker as fitted to these locomotives consists of four main units, the engine or power unit, tender conveyor unit, intermediate conduit and riser conduit. The engine, which is mounted on the tender front dragbox, provides the necessary power under all conditions to supply coal to the firebox, and can be throttled down to furnish the coal as sparingly and continuously as required. It is possible to work the engine in reverse in case of a blockage in the stoker mechanism.

The tender conveyor unit consists of a trough, conveyor screw, crusher and gearbox. The trough is located below the coal bunker and is mounted on rollers to take care of the movement between engine and tender. The power from the engine unit is

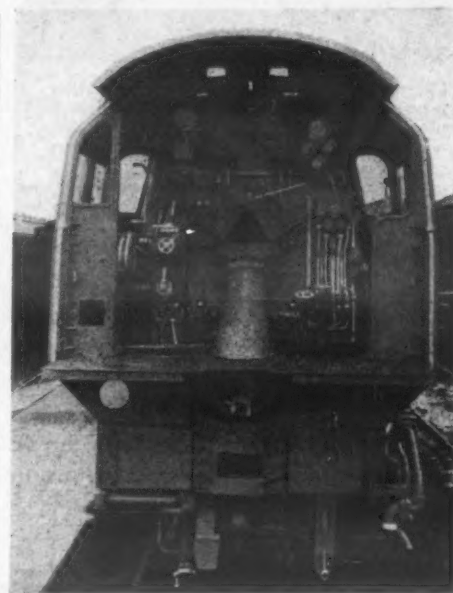
transmitted to the gearbox mounted at the rear of the conveyor unit by means of a slip shaft with universal joints. The gearbox transmits motion to the conveyor screw, which carries coal from the bunker through the crusher, where it is broken down to the correct size and is then fed into the intermediate conduit.

The intermediate conduit includes a conveyor screw enclosed in a conduit or casing, which is connected to the riser by a special ball joint. The riser conduit, which extends upward through the footplate and is secured to the back of the firebox, includes a further conveyor screw which is connected to the intermediate screw by means of a universal joint. The riser screw has a reverse flight at the extreme end and this results in the coal being levelled down and spread out prior to delivery into the firebox, thus ensuring a uniform delivery of coal over the distributor plate fitted above the hooded jet plate, and located at the underside of the firehole.

The jet plate fits in the lower portion of the mouth of the riser conduit and means are provided for easy adjustment to the proper firing angle. The front of the jet plate has hoods above the jet orifices which allow divergence of the steam jet before meeting the coal, thus ensuring efficient distribution over the grate. The jet plate is divided into four compartments, each controlled by a separate valve located in the jet manifold and marked to indicate which section of jets the valve controls, i.e. left front, right front, left back and right back.

### Pressure Gauges

Pressure gauges are located on a panel in the cab. In the case of the right- and left-hand gauges the black hand indicates jet pressure for the back corners and the red hand indicates jet pressure for the front of the firebox. The centre gauge shows the stoker engine pressure. The jet casting is pro-



Footplate of Class 9F locomotive fitted with Berkley stoker, showing the riser conduit and screw with its joint for connection to the intermediate screw. On the right are the cocks controlling the steam jets which distribute the coal in the firebox

tected from the heat of the fire by a protecting apron held in place by a removable pin.

With this form of stoker it is possible to adjust independently the coal feed and the steam jet pressures and thus obtain an even distribution of coal in the firebox under all conditions. It is possible to fire the locomotive by hand in case of failure of the stoker or when it is necessary to correct the firebed after removal of clinker, etc., and also when working the locomotive on comparatively short journeys where time would be insufficient to allow correct setting of the coal feed and jet pressures of the stoker. The three engines have been provided with double chimneys and trials will be run to determine to what extent their hauling capacity can be increased by these means. They will be based on Saltley motive power depot. The possibility of fitting mechanical stokers to other Class 9F 2-10-0 locomotives will depend on the results of the trials.

## SERIES OF EXHIBITIONS

### Practical Uses of Nickel Alloys

A SERIES of four-day exhibitions devoted to the practical uses of nickel and its alloys are to be held in Newcastle, Leeds and Belfast during September and October by Henry Wiggin and Co., Limited. The first will be at the Royal Station Hotel, Newcastle upon Tyne, from September 23-26, the second at the Metropole, Leeds, from October 14-17, and the final one from October 28-31 at the Grand Central Hotel, Belfast. Running concurrently with each exhibition will be a series of lectures and film shows demonstrating the practical uses of Wiggins alloys in high-temperature work and in chemical and electrical engineering; others will feature welding techniques.

The exhibition will include displays illustrating the various properties of the Wiggins alloys—corrosion resistance, high-temperature properties, electrical resistance and special physical properties—and these will be backed by over 300 examples of actual components, each using one or more of the alloys, to show how all industries take practical advantage of the special characteristics.

### Engine Applications

In the aero engine section, for example, the important contributions made by the Nimonic series of alloys to the development of every British turbine and jet engine will be illustrated by turbine wheels, turbine blades, flame tubes and other components and the automobile section also places emphasis on these high-temperature characteristics by the inclusion of exhaust valves and manifolds for high-efficiency piston engines.



## HARD GOING FOR BUS OPERATORS

Comments by B.E.T. Company Chairmen

### NO HALT IN RE-EQUIPMENT PROGRAMMES

**S**PEECHES by chairmen of bus companies at their annual general meetings may be expected to conform to a general pattern unless something untoward has occurred in a particular area and this has been true in recent months as regards companies associated with the British Electric Traction Co., Limited, and with their parent concern. A good deal was said by the chairmen about the strike of provincial busmen which lasted from July 20 to 29, last year, and the unfortunate affect which this had not only upon traffic figures but also, and more important from the long-term viewpoint, the way in which it impaired public goodwill.

The overall picture was summed up by Mr. H. C. Drayton, chairman of the British Electric Traction Co., Limited, when he said that the experience of last year had sounded a serious warning to those engaged in the provincial bus industry. "We have lost passengers as a result of the strike. We have also lost more passengers as a result of having to increase fares to meet the higher wages, and, what is more serious, we have found that traffic receipts have fallen despite the higher fares. To meet these increased costs serious consideration has had to be given to our unremunerative route-mileage which is approximately 40 per cent. We have found we cannot afford to run so large a proportion, as the loss on these routes has increased and also the surplus from the profitable routes has decreased. All three bodies of people interested in the bus industry are affected—the public by decreased services, the men by less numbers being employed and the companies by less profit—and any further increase in costs, unless there is an alleviation in the tax on fuel oil, will have a further effect upon these three classes of people, and in my view not to their benefit."

#### General Traffic Decline

Common to all speeches were reports of fallen traffic and it was pointed out in several cases that even inclusive tours showed decreases compared with the previous year due to cancellations caused

more to afford relief which it had been confidently expected would have been forthcoming. In that quarter, therefore, must rest the responsibility for the greater isolation of the rural inhabitants which the reduction of public transport facilities inevitably brings in its train."

He went on to emphasise that, despite this handicap, the company was doing its best to maintain such services and cited the figures of unremunerative mileage and services set out in an accompanying table together with comparable percentages provided by other chairmen in their remarks.

	Per cent mileage unremunerative	Per cent services unremunerative
Maidstone and District	41.86	61.8
Northern General	27	38
Southdown	47	—
South Wales	35	47

#### Fleets and Buildings Modernised

The adverse circumstances of the year under review did not, however, deter the various companies from continuing to modernise their fleets and erect new buildings. The latter were, of course, in most cases expected to result in economies in operating costs and in improved maintenance. Maidstone and District reported plans for the replacement by buses of the trolleybuses of the erstwhile Hastings Tramways Company and that, if deliveries of the new vehicles required were forthcoming, the changeover should be made early in 1959. During the year 35 new one-man buses were placed in service to make the company one of the largest operators of that type of vehicle in the country. At a cost of £286,000 Northern General added 23 double-deckers, 28 single-deckers and 14 coaches to its fleet, while during the year the garage at Percy Main was brought up to modern standards and the new workshops were completed. A start was made in an extension of the garage at Philadelphia to provide covered accommodation for a further 45 vehicles, a new block of offices and a canteen; the original garage was to be modernised and new bus cleaning and washing plant installed. Plans were approved for the extension of the



The chairmen of several B.E.T. companies referred to the continued success of inclusive tours and the support these gave in meeting losses on stage services. This Harrington-bodied A.E.C. Reliance of Maidstone and District is seen at Foyes on the Southern Ireland tour introduced this year

by the strike. Nonetheless this side of the operations generally had suffered least from the decline in traffic and the Northern General Transport Co., Limited, dealt with a record number of holiday tour passengers in 1957, despite cancellation of 35 tours. Its chairman, Mr. W. T. James, remarked that this part of the activities, together with private hire and express services, helped in no small measure to subsidise stage carriage services.

The effects of the delay occasioned by the necessary procedure to obtain authorisation to increase fares were also stressed by the chairman and Mr. J. Spencer Wills, chairman of B.E.T. Omnibus Services, Limited, summarised the opinions expressed when he said: "Of course, the wages increases of last summer could not have been supported without increases of fares, which were granted by the traffic commissioners after the usual, and unfair, time-lag which, through no fault of the commissioners—and certainly not of ours—results from the present statutory procedure. That procedure denies us the right to apply for interim adjustments, a right which is enjoyed by the railways and by London Transport."

"What happens, in practice, is that one official tribunal (an arbitration tribunal) imposes extra costs (wages) and there is a gap—we are fortunate if it is less than three months and it may be much longer—before we are authorised by another official tribunal (the traffic commissioners) to cover these costs. This is manifestly unjust and could, in certain circumstances, be fatal to our financial stability. In sanctioning these latest adjustments of fares the commissioners approved what were considered to be reasonable allowances for passenger resistance, but, in very many cases, the higher fares have resulted not merely in decreased traffic, but even in decreased receipts."

#### The Fuel Tax

Dislike by bus operators of the 2s. 6d. per gal. tax on fuel has become almost a King Charles's head so far as the industry is concerned, but in fairness to the chairmen it should be recorded that they again called attention to the effect of this tax upon their operations and particularly the poorly patronised services in rural areas. Mr. Drayton said that the B.E.T. companies had to pay 4.3rd. every time one of their buses travelled a mile. "I suggest that is too much for a sleeping partner to take who does little or nothing towards earning it. The lilies of the field at least look beautiful." In his address to the Maidstone and District shareholders Mr. R. P. Beddow said: "Although representations were again made from all sides, and many reasoned speeches have been made on the subject in the House of Commons by Members of Parliament who have a particularly strong interest in the maintenance of services in the country districts, the Chancellor of the Exchequer failed once

garage at Murton to house 40 more vehicles and to build new workshops.

West of the Pennines the Ribblesdale company opened its new garage adjoining Burnley bus station in February of this year and this accommodates the 120 vehicles of its own and the W. C. Standerwick fleet previously housed in three separate garages which were consequently closed. In his speech Mr. R. P. Beddow referred also to the extension of long-distance coach services, including the new Skipton—Llandudno route with its numerous connections, and to the acquisition of several excursions and tours businesses. To Southdown shareholders he gave some impressive figures on the score of fleet replacement. In the year under review the company had introduced 10 double-deck buses and 49 coaches and it now had one of the most modern fleets in the country. Since new vehicles had become available after the war it had replaced no fewer than 1,002 buses and coaches at a cost of £3,875,000. The acquisition of Triumph Coaches, Limited, Portsmouth, in May, 1957, had been thoroughly justified by the trading results so far.

The annual meeting of the South Wales Transport Co., Limited, was told by Mr. W. T. James that £100,000 had been spent on new vehicles in 1957. The transport advisory committee, on which sat members of the company and of Swansea Corporation, had been created by the Swansea and District Act, 1936, and was dissolved by the same Act on December 31, 1957. Although such arrangements did not always represent the best answer to the transport problems of a particular town, it had been felt that this committee, covering the transport activities of Swansea, should not be disbanded. Accordingly, the company voluntarily entered into a further agreement with Swansea Corporation continuing the transport advisory committee almost exactly on the same basis as before. He confidently anticipated that this new committee would continue to serve the interests of the travelling public as capably as the old.

A new type of tubular plastics curtain rail with enclosed rails and eyeleted runners now being made in a variety of colours by Tubeway (Sales), Limited, 59 Brompton Road, London, S.W.3, appears to have a number of potential applications in transport vehicles.

Under the name Muraflux, Murex Welding Processes, Limited, is producing a group of new powder fluxes for submerged-arc welding. Muraflux A, the first of these new fluxes, has been developed to meet the need for a high-quality general-purpose flux for the submerged-arc welding of mild steel. It can be used on either a.c. or d.c. supplies with welding currents up to 900 amp. and on all machines suitable for submerged-arc welding.



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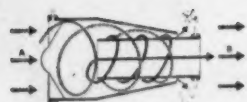
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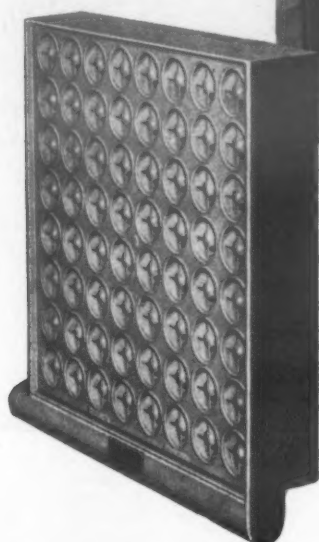




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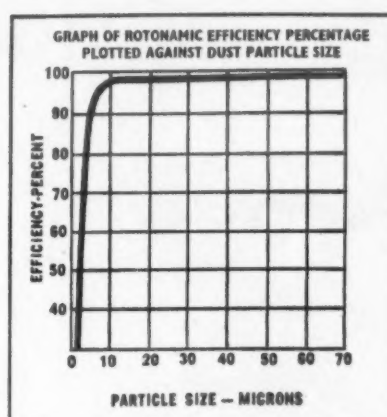
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## NEWS FROM ALL QUARTERS

### Railway Coaches Reserved for Ladies

Ten of 50 new cars, all air-conditioned, for the Hudson and Manhattan Railroad are to be reserved at rush hours for ladies, reviving an early tradition on this line, which operates beneath the Hudson between Manhattan and New Jersey.

### Railway Wage Review

Talks between the British Transport Commission and the three railways unions on the promised wage review are to begin on August 25. It will be recalled that when the railwaymen were given a 3 per cent wage increase in May it was agreed that there should be an inquiry to make a comprehensive examination of the wages structure. The unions want this to be an independent, not a domestic, inquiry.

### Glasgow—Oban Diesel Train

On August 11 and 12, as an experiment, the noon steam train from Glasgow Buchanan Street to Oban was replaced by a five-car diesel train including a miniature buffet in the second coach. On the same dates, the 5.15 p.m. train from Oban to Glasgow was worked by the same diesel train. The 11.40 a.m. Edinburgh Princes Street to Stirling was a diesel and this was attached to the noon train ex Glasgow. The 9.1 p.m. Stirling to Edinburgh Princes Street was a through diesel portion off the 5.15 p.m. from Oban to Glasgow. The purpose of the experiment was to see if this type of unit could in due course provide the passenger services on the Oban branch.

### Road Diversion in Coventry

Queen Victoria Road, an important thoroughfare in Coventry, is to be diverted at its northern end to lead straight into Corporation Street. The new section of road, 242 yd. long, will be considerably wider than the old one with a 44-ft. divided carriageway and two 18-ft. footways. Buildings for business and shopping purposes will be constructed alongside the new frontages and these will be used to resettle people and businesses displaced by redevelopment carried out in other parts of the city. The Minister of Transport and Civil Aviation has made a grant of nearly £80,000 towards the cost of the scheme, estimated at £160,000. The work has been designed by the city engineer and county surveyor of Coventry, Mr. Granville Berry.

### Labour Convention in Force in October

The Netherlands has become the second country to register with the International Labour Office its ratification of the European convention concerning the social security of international transport workers. Poland ratified the convention in January and now it comes into force in October this year in conformity with the provision in the convention which states that it shall enter into force two months after the second ratification. The aim of the convention is to ensure that international transport workers receive the benefits of social security when, during their duties, they find themselves in another country. They are specifically covered for sickness, maternity, accidents, occupational diseases and death. The convention applies to railway, road transport, aviation and inland navigation transport workers.

### Diesel Railcars on Western Region Branch

Diesel railcar service will replace push-and-pull steam trains on the Western Region Ealing Broadway—Greenford branch in West London from Monday, August 25.

### Loan for Mount Isa Railway?

The Australian Government is sending urgently to the World Bank a detailed application for a £A30 million loan to modernise the Mt. Isa—Townsville section of the Queensland Government Railway. Details of the submission were worked out at a conference between Commonwealth and Queensland ministers. The Bank hopes to reach a decision within six weeks. Commonwealth authorities handling the negotiations believe that it will grant the loan.

### Glasgow Abandonment to be Accelerated

Glasgow Transport Committee has agreed to dispose of the tramcar fleet within a period of five years instead of 10 to 15 years as formerly contemplated. The remaining tram routes are to be converted to bus operation by 1963. A maximum of about 200 trolleybuses will be employed. Between May and December this year 120 trams will have been withdrawn, leaving 510 still on service. By 1961 it is expected that all obsolete cars will be scrapped, leaving only the Coronation types to be dealt with. The three-phase programme announced earlier will probably be adhered to.

### Forth Bridge Tenders Accepted

A tender of £8,660,000 by the A. C. D. Bridge consortium for the superstructure of the road bridge across the Firth of Forth has been accepted by the Forth Road Bridge Joint Board. The board also accepted the tender of £2,200,000 by John Howard and Co., Limited, for the building of foundations and piers. The A. C. D. Bridge Company is a consortium of three British firms—Sir William Arrol and Co., Limited, the Cleveland Bridge and Engineering Co., Limited, and Dorman Long (Bridge and Engineering), Limited. Total cost of the bridge, with approach roads and other work, is now estimated at about £16,500,000. The last estimate was in the region of £15 million. It is expected to be open in 1962.

### Rail Freight Speed-Up in Victoria

A new freight service between Melbourne and Perth (distance 2,105 miles) has reduced the time taken to deliver freight by nearly half. The Victorian Railways announced recently that goods leaving Melbourne each Wednesday at 2.30 p.m. now reach Perth at 12.28 p.m. the following Tuesday. Before the new faster service was introduced the time taken for the Australian transcontinental goods service was 10 days, and sometimes more. The Australian Minister of Transport, Sir Arthur Warner, described the acceleration as the railway's answer to the challenge of other competitors for interstate traffic. A further speed up has taken place on other freight trains which leave Melbourne for Perth on Mondays and Thursdays. These now reach Perth in eight days. Western Australian Government Railways co-operated in accelerating the services by providing special connecting freight trains from Kalgoorlie to Perth.

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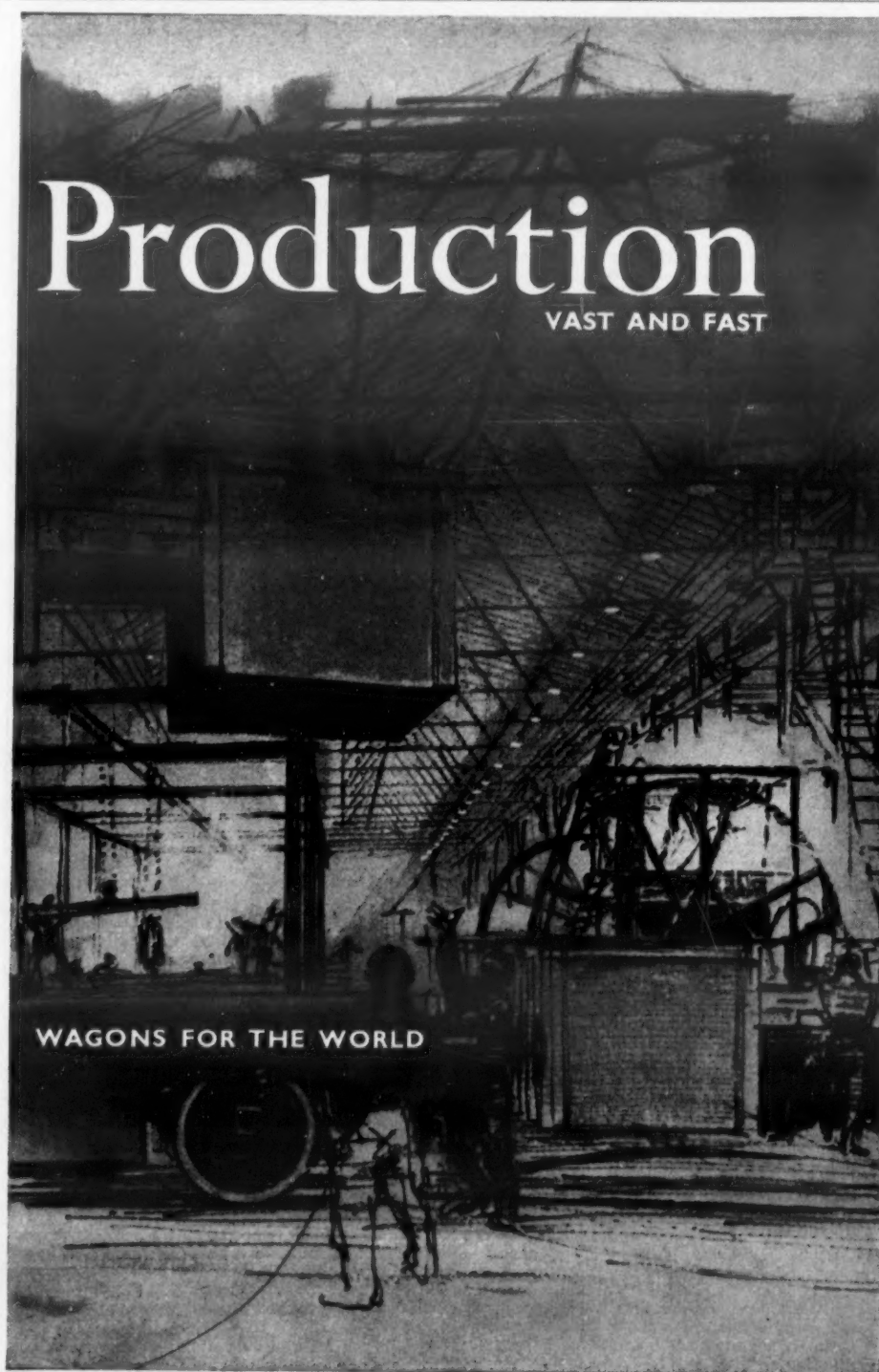
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## Production

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## COMMERCIAL AVIATION

### B.O.A.C. Results and Prospects

#### OVERHAUL LIFE OF DARTS

AT London Airport last week Mr. Basil Smallpeice, managing director of the British Overseas Airways Corporation, said at a meeting of representatives of the staff of the corporation, that in the first four months of the current financial year, beginning on April 1 last, B.O.A.C. had achieved a 32 per cent increase in business on the dollar earning transatlantic routes between Britain and the U.S.A. and Canada. On the eastern routes during the same period, however, the revenue had hardly increased at all compared with last year and on the African routes it had actually fallen. In the result, there was an overall loss of £400,000, whereas the corporation had budgeted for a profit in that period of £200,000. Dealing with plans to improve the corporation's general competitive position, Mr. Smallpeice said that deliveries of the de Havilland Comet 4 to B.O.A.C. were due to begin towards the end of September and he fully expected the contract dates to be met by the manufacturers. So far as could be foreseen at the moment this aircraft would go into passenger service between London and New York by about the beginning of December; it was impossible for the time being to give any precise date for the first service. In the initial phase the Comet would operate a first-class de luxe service once a week in each direction but this would soon be brought up to a daily frequency. Britannias were to be introduced on the route to East Africa in October—six months ahead of schedule—and it was planned to extend Comet 4 operations next May by introducing four Comet services a week from London to Tokyo via Hong Kong. The Comet was scheduled to take over from the Britannia in December, 1959, the services from Britain to Australia on the Kangaroo route.

#### African Air Agreement

The East African Airways Corporation and Central African Airways Corporation have negotiated a commercial agreement covering their joint participation as pool partners on routes over which the bulk of the regional traffic flows between East and Central Africa. The pool comes into effect on January 1, 1959.

#### Rotodyne in U.S.A.

The Fairey Aviation Co., Limited, announced on August 19, that it had agreed with the Kaman Aircraft Corporation, of Bloomfield, Connecticut, on terms of a licence for the manufacture and sale of the Fairey Rotodyne v.t.o. air liner in the United States. The company stated that this step was being taken in order fully to exploit the potentialities of the aircraft in the military and civil markets of the U.S.A. The agreement is subject to the approval of the U.K. and U.S. governments.

#### New Services Approved

The Minister of Transport and Civil Aviation, after considering the recommendations of the Air Transport Advisory Council, has approved the operation of the following services:

A normal scheduled service between Manchester and Ostend; Eagle Airways, Limited, until June 19, 1961.  
An internal service between Southend and Newcastle; B.K.S. Air Transport, Limited, until January 31, 1965.  
An inclusive tour service between London (Blackbushe) and Basle; Air Hire, Limited, until August 30, 1958.  
An inclusive tour service between Lydd and Perpignan; Silver City Airways, Limited, until September 24, 1958.  
A normal scheduled service between London Airport and/or London (Blackbushe) and Ostend; Eagle Airways, Limited, until October 31, 1964.  
An inclusive tour service between London Airport and Basle; Hunting-Clan Air Services, Limited, during the period June 1, 1958, to September 28, 1958, and a similar season in 1959.

#### Reconfirm Flight Reservations

North Americans with tickets to fly back from Europe this summer have been advised to be certain to reconfirm their reservations if they want to get home on time. The scheduled transatlantic airlines now require passengers holding reservations on westbound flights out of Ireland, the United Kingdom and continental Europe to the United States and Canada to reconfirm their space not less than 48 hours before flight time. Their failure to do so will allow the airlines to make the space available to other passengers. The new rule is part of a concerted effort by all the airlines to eliminate no-shows—passengers who have reservations they don't use and who thereby deny space to others who need it.

#### B.E.A. Withdraws Elizabethans

The passing from British European Airways service of the Elizabethan (de Havilland Airspeed Ambassador) was recorded by Lord Douglas of Kirtleside, the chairman, in his latest message to the staff. This "sad but inevitable event" had ended, after about 6½ years, B.E.A.'s Elizabethan era. During this time Elizabethans carried nearly 2½ million passengers and flew about 1,000 million passenger miles at the very good average load factor of 67.5 per cent. The aircraft made 90,000 flights and flew a total of 30 million miles. He described the Elizabethan as "a most successful aeroplane of which its manufacturers—and the British aircraft industry, as a whole can be justly proud." The last scheduled service was flown from Cologne to London on July 30.

#### Dart Overhaul Life Development

The most outstanding success of the Rolls-Royce Dart turboprop engine has been the rapid increase in overhaul life. British European Airways now has 256 Dart engines of three different types in regular service, a larger fleet than any other operator. Its Dart engines have now accumulated nearly 1,150,000 hr. and future utilisation will be at the rate of nearly 500,000 hr. per year. Since April, 1953, when the first scheduled service was operated, the overhaul life has been progressively increased from 400 hr. to the present approved life of 1,800 hr. for the Dart 506 and 510 type engines. The Dart 506 engine (Viscount 701) and the Dart 510 engine (Viscount 802) are at present running development trials to 2,000 hr., and it is hoped to obtain approval of this overhaul life by this October. Further trials will later proceed in progressive stages to 2,500 hr. The improved and more powerful Dart 520 engine (Viscount 806) has an approved life of 600 hr., but it is hoped that this will shortly be extended to 800 hr. as the result of current trials. Further trials will then proceed in progressive stages to 2,000 hr. The first B.E.A.-overhauled Dart 506 engine is now in service. The first two engines will be examined at 600 hr., the second two at 1,200 hr. and, if satisfactory, it is then hoped to obtain the same approved life for B.E.A.-overhauled engines as those currently approved for Rolls-Royce overhauls. Equally successful on life development is the Rotol propeller, approved for 2,100 hr.

## DEATH OF WELL-KNOWN SIGNAL ENGINEER



The late Mr. A. MOSS, M.Inst.T., M.I.R.S.E.

When Mr. Arthur Moss, whose recent death we record with great regret, relinquished the post of signal engineer, Eastern Region, British Railways, on April 30, 1956, he had had 50 years in railway service and had been connected both in the thirties and after the 1939-45 war with a large number of resignalling schemes. He received his technical education at the Manchester School of Technology and began his career in 1906 on the former Great Central Railway. He was actively associated with the many mechanical, power, track circuiting and colour-light signalling schemes carried out on that system. During the 1914-18 war he served with the Royal Engineers (signals) and after the grouping of the railways was transferred to the L.N.E.R. signal engineer's office at Liverpool Street, London, where in 1926 he was appointed indoor assistant. This position he vacated in May, 1931, on becoming chief assistant (signals) to the engineer (Scotland). In April, 1933, he was made signal and telegraph assistant to the engineer (Scotland), becoming signal and telegraph engineer, Scottish Area, in June, 1936. While in Scotland he carried out much modernisation work, involving track circuiting, colour-light signalling and power-operated points. He introduced four-aspect colour-light signalling between Glasgow Queen Street, Kelvinhaugh and Partick Junction, was responsible for the conversion of Waverley Station to complete power signalling, including a modern public address system, the provision of colour-light signals and remote control of junctions from a panel at Galashiels, and carried out many other interesting schemes. In the communications field, amongst other works, the headquarters telephone exchange was modernised and converted to full automatic operation, and new traffic control offices were provided at Glasgow Queen Street and Aberdeen. In 1943 he returned to London as assistant to engineer (signals) at Kings Cross, receiving his appointment as signal and telecommunications engineer, Eastern Region, on January 1, 1948. During his tenure of this post he was, among many works, particularly concerned with the Liverpool Street—Shenfield electrification and its extension to Chelmsford and Southend Victoria and also with the installation of the experimental automatic train control section on the East Coast main line. Mr. Moss, who was a member of the Institute of Transport, was elected a member of council of the Institution of Railway Signal Engineers in 1933 and served continuously in that capacity until 1946, when he was elected a vice-president; he was president of that Institution for 1948-49.

## HOT AXLEBOXES

### Electronic Detection

By a Correspondent

PREVENTIVE maintenance reduces the number of hot axleboxes to a minimum, but they do occur, with consequent delay to traffic and temporary loss of wagons. On passenger trains they are more rapidly detected owing to the under parts of carriages being inspected by carriage examiners at junction stations along the route. With freight trains this type of inspection usually takes place during the sorting of freight trains in marshalling yards.

Several railways in the U.S.A. have developed a system of electronic detection whereby every axlebox on a train is checked and recorded on a graph. Electronic devices and infra-red rays emitted from heated metal measure the temperature although the pyrometer may be 10 or 15 ft. away from the source of heat. Tests in service proved that the temperatures of axle bearings on goods wagons, from normal to hot, are within a range that can be detected by an infra-red sensitive device located 3 to 5 ft. from the axleboxes.

#### Adaptation of Pyrometers

In order to adapt these infra-red pyrometers for detecting hot axleboxes on passing trains some of the first difficulties were (a) what part of the axlebox could be and should be "viewed" and (b) where should the pyrometer be located on the way-side. The top of the axlebox itself has the best metallic contact with the bearing, thus the top side of the box would give a better indication of the temperature of the axle than would the lid. The top of the box is inaccessible to view from any angle. It was therefore decided to locate the way-side pyrometers between the ends of two adjacent sleepers, about 16 in. from the gauge line to the centre of the pyrometer lens. The second pyrometer is placed in a similar position at the other side of the track so that each journal of an axle is recorded.

The "view" centre line of each pyrometer is pointed in the direction of the train movement and at an angle of 30 to 40 deg. above horizontal. As an axlebox recedes from the detector, the pyrometer inspects first the bottom of the box and then up along the rear side to the top. The pyrometer has a meniscus lens which covers an area on the box of approximately 1 sq. in. This allows for lateral movement within the truck as well as between wheels and rails. The thermistor bolometer, or sensitive element, in each pyrometer, receives infra-red rays from any and all heat sources within the range of vision all the time a freight train is passing.

#### Split Second Periods

The problem is to confine the final recording of the indications only to the split second periods when each box is in range and excluding all other heat sources such as hot brake shoes, hot wheel rims, etc. This is attained by automatically controlling the circuit to the graph recorder so that it indicates only while each box is within range of its respective detector. These controls are initiated by two wheel-actuated electro-magnetic transducers. These are contained in a metal case about 4 in. by 4 in. by 8 in. and they are bolted to the web of the rail, where they cannot come in contact with wheel flanges even if down to maximum permissible tread wear. As the rim of a wheel passes through the magnetic field of the transducer an inductive surge is generated which indirectly energises a relay in the circuit to the recorder.

When the axlebox has receded beyond the range of the wayside pyrometer, the corresponding wheel passes over a second transducer causing an inductive surge by which the relay is released. Two transducers on one rail control the circuits to the recorder for two pyrometers, one on each side of the track. The detector system operates for speeds up to 60 m.p.h.

#### Lens Protection

The infra-red rays from an axlebox enter the wayside device through a 2-in. lens made of special material that will transmit them. Dirt and moisture must be kept from the lens to avoid interference. The pyrometer is enclosed in a protective metal case with a circular opening about 2½ in. in diameter, normally closed by a metal disc. The lens is protected from rain and dirt during inactive periods. On the approach of a train, the disc is moved away from the opening by a solenoid controlled by impulses from the magnetic transducers fixed to the rails. The lens remains uncovered until the whole of the train has passed. The detector is not affected by dirt falling from a passing train as this is swept along in the train's direction. This is one of the reasons for examining the axleboxes as they recede rather than as they approach.

The relative heat emitted by each axlebox on every freight train is registered on graph paper on a twin recorder. This recorder starts automatically when a train approaches and is stopped when the rear of a train has passed the detector. The speed of the graph paper is adjustable. The recorder has two pens, one for each detector. The pens are operated by galvanometer action and are therefore very fast. As each axle passes the wayside pyrometer a mark is made by the recorder. An axle at normal temperature makes a small movement of about 2 to 3 mm. An axle hot enough to cause trouble will make a mark 15 to 20 mm. in size. An adjustment can be made to increase or decrease the relative pen movements.

#### Detection Method

Thermistor type bolometers are used in the wayside detectors. Each includes two electrical resistance units in the form of flakes of material, a characteristic of which is that heat decreases its electrical resistance. The incoming infra-red rays from the axleboxes are directed on to the A flake and thereby decreases its resistance. The B flake is shielded from the effects of the infra-red rays and its electrical resistance is controlled primarily by ambient temperature. This equipment does not actually measure temperature in degrees but it gives an electrical signal proportional to the amount of heat energy falling on the A flake. In all instances the value of the differences between a normal axlebox and a hot axlebox is amplified in the electrical equipment.

In later installations means have been devised for hot axlebox alarms to be transmitted from outlying locations to the central traffic control office from which place directions can be issued to stop trains for examination. The New York Central system has installed hot box detectors to inspect boxes on freight trains in its centralised traffic control territory at Fairview, 10 miles west of Erie, where the graphic recorders are located in the train control office.



## ROAD VEHICLE INDUSTRY

## Mobile X-Ray Unit and Laboratory

RECENTLY delivered to the University of Manchester Rheumatism Research Centre a mobile X-ray unit and a mobile laboratory are based on semi-trailers drawn by Karrier Bantam tractors with bodies in light alloy and plastics by Holmes (Preston), Limited. The units, both of which are completely self-contained, may be used separately or together to provide a complete field research unit. The X-ray unit is 24 ft. 7 in. by 7 ft. by 6 ft. 6 in. high internally

alloy mouldings, and the bodies are insulated throughout with Polyzote.

## B.M.C. Driver's Club 100,000th Member

THE 100,000th member has been enrolled by the B.M.C. Drivers' Club only 32 months after its formation. Announcing this recently, Mr. A. W. Hopton, national organiser of the club, said that the first certificates and safe-driver



Two Holmes-bodied semi-trailers hauled by Karrier Bantam tractors form this self-contained X-ray unit and laboratory for Manchester University Rheumatism Research Centre

and houses a dark room, X-ray room and patients' waiting room; the laboratory unit, 20 ft. 2 in. by 7 ft., comprises two reception rooms and a well-equipped laboratory. There is a detachable covered passage to connect the two units and electricity and water supplies (there is provision for connecting to mains) can also be interconnected. Construction of both bodies is of Homalloy light-alloy framing with hardwood packings and sides, fronts and backs of prefabricated plastics. Alloy plate floors are covered with heavy linoleum. Internal panelling is of Besite on hardboard and plywood, with polished

badges would be awarded at the end of the year. These will be for three, five and 10-year periods of immunity from any blame-worthy accident.

## Heating the Guy Invincible

DEVELOPED by Smith's Motor Accessory Division for the Mark II Guy Invincible range, which we described last week, is a new heating and ventilating unit designated F465. The unit has a heat output, equivalent to over 4½ kilowatts, yet is compact, and takes in both fresh and recirculated air. Special attention has

been paid to efficient demisting and defrosting and four outlets are arranged to cover the whole windscreen. With the two outlets to the cab open, the velocity of air reaching the windscreen is 1,500 ft. per min. and with all air directed to the screen, a velocity of over 2,000 ft. per min. can be obtained.

## Mobil Anti-Freeze Price Reduced

A REDUCTION of 6s. a gal. in the price of Mobil Permazone anti-freeze has been announced by Mobil Oil Co., Limited. The new prices are 5-gal. drums 50s. 8d. per gal., gallon cans 52s. each and quart cans 13s. 5½d. each.

## Self-Gripping Ratchet Spanner

EXTREMELY useful for dealing with awkwardly situated bolts and nuts as well as a time saver for normal bolting jobs is a patented spanner or wrench incorporating back-slipping ratchet jaws introduced by F. C. Daniells and Co., Limited, 11 Wardrobe Court, 146A Queen Victoria Street, London, E.C.4. The Bessy spanner is available in dull chromium-plated chrome vanadium or other alloy steel in various standard set sizes and in four sizes with adjustable jaws.

## All Synchronesh Gearbox for Daimler

RECENTLY introduced by Transport Vehicles (Daimler), Limited, for its passenger chassis is a new four-speed gearbox having synchronesh applied to all forward gears. The unit is the David Brown SP450 box which embodies Porsche-type synchronisers and is claimed to be of no greater size and weight than a conventional gearbox. It is designed for 350 lb./ft. maximum engine torque and wide versatility for use with various engine and vehicle types.

## Back to Castor Oil

SMELLS reminiscent of early motoring, particularly of the race track and trials course, are likely if some of London's buses are unfortunate enough to suffer overheated axles in future. London Transport, after highly accurate measurements of results with a few buses over the past three years, has decided to change from mineral to castor oil in the back axles of 1,358 double-deck buses—a fifth of its motor bus fleet. Castor-based lubricants, which have good load capacity and a low coefficient of friction, were at one time used extensively in high-performance and highly stressed engines but, due to higher cost and a tendency to gumming, have

latterly been replaced in road vehicles by mineral oils. London Transport's careful experiments have shown that with castor oil in the axle, there is a saving in fuel consumption of 2 to 3 per cent. Discounting its higher cost, the use of castor oil is expected to save £20,000 a year in the current large-scale trials and, if the earlier results are confirmed, £120,000 a year when all buses are converted. The castor oils used by L.T.E., the best-known of which is Wakefield's Castrol R, contain oxidation inhibitors which effectively reduce gum formation.

## Karrier-Walker 12-Seat Bus

IN collaboration with B. Walker and Son, Limited, Karrier Motors, Limited, has introduced the new 12-seat Karrier-Walker bus that fully complies with recently amended p.s.v. regulations. The vehicle is on the well-proved Karrier 10 ft. 3 in. wheelbase chassis powered by a Rootes four-cylinder petrol or diesel engine, which has been modified in certain respects to conform with the regulations. With 12 conventional seats, central gangway, sliding door at the front nearside, luggage space and room to fit overhead parcel racks, the Karrier-Walker has all the usual features of a large bus.

## C.V. Servicing in London

FEATURES of the new B.P. St. Martin's Service Station, recently opened in Royal College Street, St. Pancras, are a deep inspection pit in the lubrication bay and a washing bay, both designed to serve heavy commercial vehicles. The station, which is operated by John Lester and Company, makes a much-needed addition to London facilities north of the Thames for big commercial vehicles.

## Mobile Infra-red Projector

POTENTIALLY useful for rapid paint drying in garage repair work or for touching up in production lines, a new mobile infra-red projector has been developed by Metropolitan-Vickers Electrical Co., Limited, although warning is given that it should not be used for drying low-flashpoint finishes without taking suitable precautions. The unit comprises a standard



Pantechnicon with translucent resin-glass dome and integral cab built by B. Walker and Son, Limited, on Ford Thames 15-cwt.

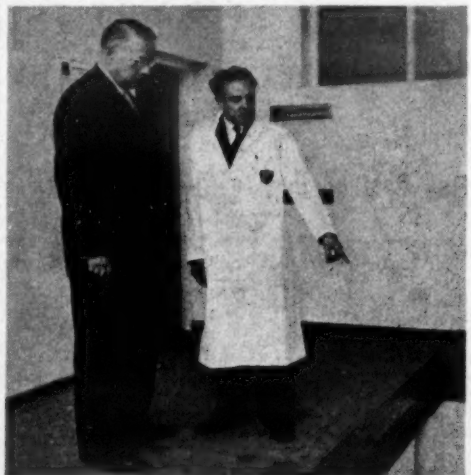
Metrovick sheathed-element projector rated at 2-2.7 kW at normal single-phase voltages mounted on a robust tripod fitted with rubber-tyred castors. Local three-heat switching is provided and height of the fully swivelling head is adjustable between 36 and 60 in. above floor level. The price complete is £40.

## New Uses for Underseal

ALTHOUGH developed for underbody coating as a protection against rust and abrasion, Underseal rubberised coating made by the Minnesota Mining and Manufacturing Co., Limited, has recently been used with success for other purposes. A Midlands farmer reports that Underseal applied as an internal coating in vans used mainly for pig transport has prevented the early corrosion of the body floors hitherto experienced. Underseal has also been applied to a porous canvas tilt on a lorry operated by Arthur L. Haigh and Company, Leeds, which reports that the tilt, previously leaking badly, has remained waterproof for two years since Undersealing.

## Colour Speeds Production

COLOUR, maximum natural and artificial lighting and modern production methods play vital parts in the manufacture of differential units for B.M.C. cars and light commercial vehicles. Colour experts and architects were called in to design the new £1 million plant at the Birmingham tractor and transmissions branch



Mr. C. T. Brunner (left), director-marketing, Shell-Mex and B.P., Limited, first customer at St. Martin's Service Station, inspecting the commercial vehicle servicing facilities

of Morris Motors, Limited, which is now claimed to house the largest collection of specialised gear-cutting and automatic transfer machinery in Europe. Crown wheels and pinions are machined and assembled in rear axle housings and leave the assembly lines at the rate of four a minute. A uniform colour scheme for the interior of the building and its 400 machines, some of which were designed and built by the branch, was realised when plans were laid down. Conveyor hooks carrying crown wheels and pinions through machining stages to the assembly lines are painted in three different colours, one for each series of vehicle dealt with, providing a valuable visual aid and helping to reduce time waste. Extensive use is made of overhead conveyor.

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# EUROPEAN SLEEPING AND RESTAURANT CARS

## International Working

AN interesting feature of postwar sleeping and restaurant car operation in Europe is the expansion of the activities of the Deutsche Schlafwagen und Speisewagen Gesellschaft, or "D.S.G.," the West German successor of the pre-war Mitropa Company. In former years international sleeping and restaurant car services on the mainland of Europe were the exclusive province of the International Sleeping Car Company, but German cars are now working through increasingly into other countries, in particular Switzerland and Holland.

This year there are daily sleeping-car services, with D.S.G. cars, between Dortmund and Inter-laken, Frankfurt and Geneva (in both cases via Basle and Berne), Hamburg-Altona and Zurich Emmerich and Chur, and Grossebrode and Chur (the two last via Basle and Zurich). In addition, D.S.G. cars operate at convenient hours to and from stations on the West German frontiers, so giving through passengers the benefit of the moderate German sleeping-car charges over the part of their journeys that lies in West German territory. Among the latter are the cars running between Aachen, near the Belgian frontier, and both Passau and Salzburg, on the Austrian frontier; between Emmerich and Cleve, on the Dutch frontier, and Chur and Munich respectively; and between Bonn and Flensburg, on the Danish frontier.

### Berth Arrangements

The D.S.G. organisation, with its well-equipped and comfortable cars, offers some of the most inexpensive sleeping-car travel on the mainland of

restaurant car service is between Nuremberg and Amsterdam, Holland. In addition there are, of course, the West German trains in the Trans-Europ-Express pool for the staffing of which the D.S.G. is responsible—the *Paris-Ruhr* and *Parsifal* between Dortmund and Paris, the *Helvetia* between Hamburg-Altona and Zurich, the *Saphir* between Frankfurt and Ostend, and the *Rhein-Main* between Frankfurt and Amsterdam.

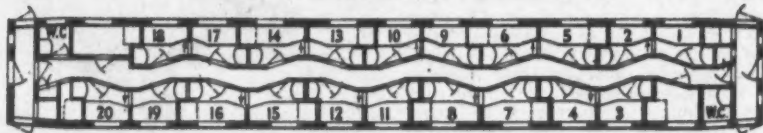
### Moderate Meal Prices

The principle of moderate charges applies equally to the D.S.G. restaurant cars as to the sleeping-cars. In the faster or F-class trains three varieties of lunch or dinner can be obtained, at DM.6.00 (10s.) for a four-course meal, DM.4.75 (7s. 11d.) for three courses and DM.3.50 (5s. 11d.) for a simpler meal. In the slower D-class express trains the charges range from DM.5.75 (8s.) down to as little as DM.2.20 (3s. 8d.). The example of this range of price to suit all means is one which might with advantage be copied by the International Sleeping Car Company and even by British Railways.

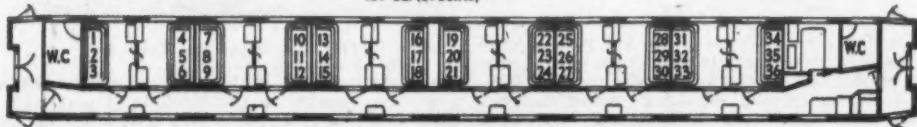
As a final note on cosmopolitanism in European luxury train and car operation, it may be added that Switzerland today sees more of the through working of complete trains and sleeping and restaurant cars, with their staffs, than any other country in Europe. Of T.E.E. trains, into and out of Zurich there run the French *L'Arbalète* from and to Brussels and Amsterdam, and the German *Helvetia* from and to Hamburg-Altona; there are also the German *Komet* sleeping and restaurant



1ST CL. SINGLE & DOUBLE



1ST CL. (SPECIAL)



1ST/2ND CL. ADAPTABLE



TOURIST CL.

Standard varieties of D.S.G. sleeping-cars operated in West Germany and recently seen increasingly on international services

Europe. For passengers holding first-class travel tickets there are three varieties of sleeping accommodation available. These are single rooms of the pre-war first-class type, "special" class smaller single rooms (formerly second class), and a berth in a double room (formerly second class also). For passengers with second-class travel tickets there are, in addition to couchettes, three-berth rooms of the former third-class type. Certain trains which carry chiefly tourists have sleeping-cars of the three-berth-room and second-class type only; certain others incorporate only the "special" single-room cars for first-class passengers; but in most cases cars are used which can be adapted at will as first-class single or double bedrooms or as second-class three-berth rooms.

The sleeping-car charges comprise the rate for the berth, the reservation fee (if the berth is booked in advance) and, in the case of the single first-class rooms (not the "special" class), a mileage supplement varying with the distance covered, i.e. DM.6 (10s.) for distances up to 500 km. (311 miles), DM.9 (15s.) for from 500 to 700 km. (435 miles), and DM.12 (20s.) for over 700 km. For first-class single rooms the berth rates range from DM.32.50 to 39.00 (£2 14s. 2d. to £3 5s.) for distances up to 500 km. and over 700 km. respectively; for first-class "special" rooms from DM.18.50 to 23.00 (£1 10s. 10d. to £1 18s. 4d.); and for berths in first-class double rooms from DM.17.50 to 20.00 (£1 9s. 2d. to £1 13s. 4d.); the tourist rates for berths in three-berth rooms, over the same distances, are from DM.11.00 to 12.00 (18s. 4d. to £1). Reservation fees are DM.3 (5s.) for single rooms, DM.2 (3s. 4d.) for "special" and double bedroom berths, and DM.1 (1s. 8d.) for tourist berths.

### Low Overall Charges

To take a typical example, a first-class passenger can obtain a berth in a two-berth room from Dortmund to Interlaken, a distance of 823 km. (511 miles) for DM.25.50 (£2 2s. 6d.), plus DM.2 reservation fee, £2 5s. 10d. in all. Or a journey from Hamburg-Altona to Munich, 819 km. (509 miles), can be made by a first-class passenger in a single room of the "special" class for no more than DM.23 (£1 18s. 4d.), plus the DM.2 reservation fee, a total of £2 1s. 8d. Such charges are very considerably lower, proportionately to the distances covered, than in sleeping-cars elsewhere in Western Europe.

D.S.G. restaurant cars also are now working through into both Holland and Switzerland. For some time past both the *Rheingold* and *Loreley* expresses from the Hook of Holland to Basle have had German restaurant cars throughout; this summer the *Loreley*, which previously included a single through coach for Lucerne and Erstfeld, is working through to Erstfeld as a complete train, restaurant car included, the starting and finishing points of whose journey are both thus in countries other than Germany. German restaurant cars also work through twice daily in each direction between Stuttgart and Zurich, Switzerland, and in the *Komet* sleeping-car train between Hamburg-Altona and Zurich. A further daily D.S.G. res-

car train from and to Hamburg-Altona, and the restaurant cars already mentioned from and to Stuttgart.

Into and out of Geneva there work the Italian *Lemano* T.E.E. train from and to Milan, another 1958 introduction, and the German sleeping-car service from and to Frankfurt, while Lausanne is served by the French *Paris-Eclair* streamlined diesel train from and to Dijon. The list is completed by the German restaurant-car service to and from Lucerne and Erstfeld and the sleeping-car services to and from Interlaken and Chur, also mentioned previously. Such through operation not only is in the interest of economy, but also tends towards better international relations; while the competitive advantage to passengers of lower charges than hitherto for beds and meals needs no stress.

## TRANSISTOR UNITS FOR RAILWAYS

### Fluorescent Lighting of Coaches

SEVEN first-class coaches now running in the five sets of vehicles forming the *Caledonian* London-Glasgow express of the London Midland Region of British Railways have been equipped experimentally with fluorescent lighting in the compartments. The lighting operates on the ordinary 24-volt d.c. supply from the coach batteries, which is converted by means of transistor inverters to provide the requisite operating voltage at a high frequency. This is the first time public service vehicles have been fitted with this type of equipment.

The 60 complete sets of equipment, each comprising a lighting fitting, transistor inverter and Osram 2-ft. 20-watt warm white fluorescent tube, have been designed and supplied by the General Electric Co., Limited. The fitting, which at present is a trial design, consists of an anodised aluminium backplate serving as a reflector, on top of which is mounted a case containing the transistor inverter and lamp circuit equipment. Dimensions of the case are approximately 12 in. long by 3½ in. wide by 2½ in. high. The two transistors are connected in a push-pull circuit with an adequate margin of safety to withstand the maximum peak inverse voltage which may occur. One transistor is mounted externally on each side of the case and in good thermal contact with it, the case metalwork thus acting as a radiator to assist heat dissipation. Windings on the transformer form the oscillatory circuit and provide the feedback to the transistors. The secondary has the usual preheating windings and is connected to the tube through a choke. Both transformer and choke are of lightweight construction, the complete inverter unit weighing only about 3 lb.

The equipment has been designed to operate over an input voltage range of 22-32 volt d.c. and to ensure striking of the fluorescent tubes at 0 deg. C.



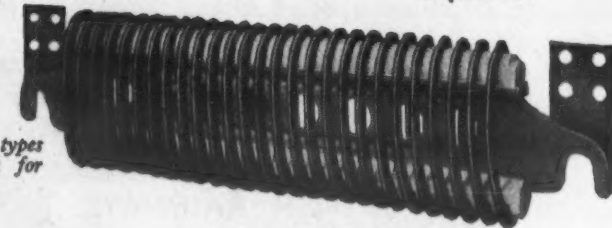
## ELECTRIC TRACTION EQUIPMENT



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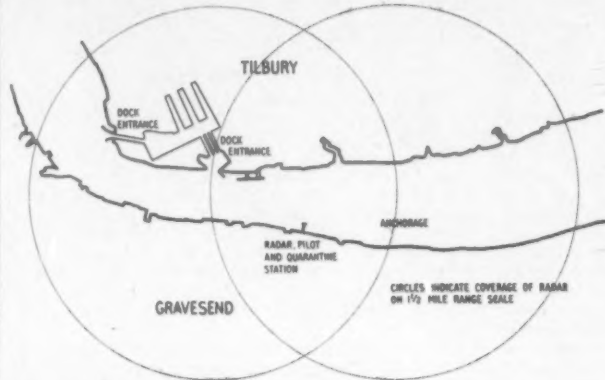
## A SERVICE TO SHIPPING

### Harbour Radar for New P.L.A. Facility

THE Thames navigation service project of the Port of London Authority is a development that should bring considerable benefit to all shipping using the port and to none more than the vessels engaged in coastwise and short sea traffic. For the first stage a new building is now under construction adjoining Royal Terrace Pier, Gravesend, and the service, which will, at the outset, comprise

health authorities grant pratique and where sea and river pilots change over. The channel is 1,000 ft. wide and, in addition, there are two entrances to Tilbury Docks, tug stations, ferries, Tilbury Landing Stage and numerous other harbour activities. Ships also use the reach as an anchorage and it has become essential for the port authority to take steps to prevent undue congestion of shipping in this area during periods of low visibility.

The Decca Harbour Radar Type 33 is a high-definition, X-band equipment using an aerial of 6 ft. span. For reliability and to ensure continuous operation during periods of routine maintenance there are two separate transmitters and receivers with remotely controlled changeover switching arrangements. The 15-in. diameter display is of the Decca fixed coil type. If experience shows still higher definition to be required, it would be possible to replace the Type 33 by a Type 32 as used at, for example, Liverpool and Southampton. The equipment will show the exact position and movement of every ship in the reach. By displaying this information in the new information centre, the staff, pilots and other river users will be able to assist in the efficient operation of the



The Decca Harbour Radar Type 33 coverage at Gravesend. It will be seen that the scanner cover can be set off-centre

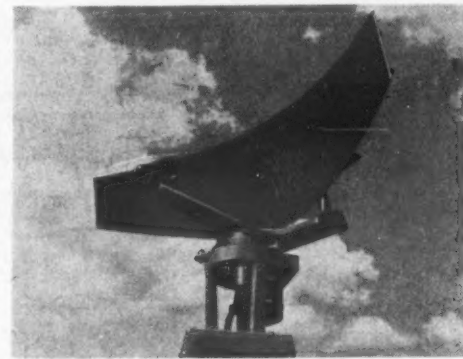
complete radio-telephone coverage up to the Pool of London and radar survey of Gravesend Reach should commence operation on May 1, 1959. It was announced last week that the radar surveillance will be by a Decca Harbour Type 33, which will have its scanner mounted on the roof of the new four-storey building with the display in the operations room.

The building has been designed round this room which will be an integrated port operating centre, collecting, sorting and providing to ships navigational information covering the whole river from the Nore to London Bridge. The radar display will provide a detailed picture of the situation in Gravesend Reach over some five miles of river. The room is designed so that, as a result of experience, further radar stations can be set up both above and below Gravesend, feeding additional displays. Eventually, if the demand necessitates, the entire river from the seaward limit of the port up to the Royal Docks will be shown on eight radar displays at one central position.

#### Critical Section

The choice of Gravesend for the first radar station means that the most critical section of the river will be the first to derive benefits from the integrated operation and economic use of facilities which such equipments make possible. Through this area pass an average of 80 ships each way every 24 hours of the day. In addition, Gravesend is the port control point where Customs and port

port under all conditions in such a way that the most expeditious and economic use is made of the facilities available. The conclusion of the Hague Convention last year which standardised marine



The scanner of the Type 33

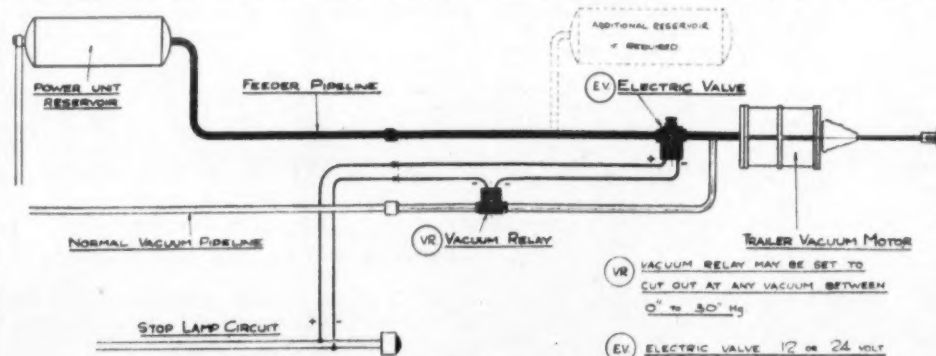
v.h.f. communication frequencies represented a great step forward in the handling of port traffic and, as already indicated, the first stage of the P.L.A. plan includes complete radio-telephone coverage up to the Pool. Pye Telecommunications equipment is being used.

## Synchronised Trailer Braking

RIPPON BROS. ZERO-LAG VACUUM EQUIPMENT

DESPITE some inroads having been made by air-pressure brake equipment into the once exclusive province of vacuum systems in medium-capacity commercial vehicles, particularly at the upper end of the medium-weight bracket, vacuum braking is still in very wide use and is likely to remain so due to its low cost, simple layout and economical maintenance. Unfortunately, where long pipe connections are required, as in vehicles drawing trailers or semi-trailers and to the front-wheel servos of a triple-vacuum system, exhausting the pipes of air each time the brake

electric valve is fitted to the trailer close to the servo motor in a second vacuum pipe connected to the reservoir on the towing vehicle, or to the trailer reservoir if one is fitted, and is wired into the stop-lamp circuit. Energising the stop-lamp circuit by pressing the brake pedal now opens the electric valve to apply the trailer brakes practically instantaneously, while the vacuum relay fitted in the normal vacuum pipe cuts out the electric valve as soon as air has been exhausted from the pipe, thus bringing the trailer brakes under the sole control of the pedal. The relay can be set to cut



Diagrammatic layout of the Rippon Bros. Zero-Lag vacuum brake circuit

pedal is used leads to a quite appreciable delay in the application of the remote brakes.

In the case of trailer vehicles, this means that the tractor brakes are hard on well before those of the trailer, often starting off the sequence that leads to jackknifing or other loss of control, and in any case resulting in a much lower braking efficiency than if all the brakes came on simultaneously. This puts vacuum braking at a distinct disadvantage with air-pressure braking, particularly in articulated tractors and vehicles intended for trailer work. Many attempts have been made to synchronise trailer brakes and a common method—to delay the application of the tractor brakes until the trailer brakes are actuated—follows rather a counsel of despair.

It does achieve synchronisation and avoids the towing vehicle being pushed into a skid by a temporarily unbraked trailer but it accepts the delay and consequently a greater stopping distance in emergency from the time the pedal is pressed.

#### Electrically Operated Valve

A device that is claimed to eliminate the time lag in vacuum trailer brakes and to achieve virtually instantaneous trailer brake actuation on movement of the pedal is an electrically operated valve developed by Rippon Bros., Victory Works, Woodend Avenue, Speke, Liverpool, 24. The valve is used in conjunction with a vacuum relay valve in a layout that has been patented by Rippon Bros. and which is simple to apply to any standard vacuum system. As can be seen in the accompanying diagram, the

out at any vacuum required between 0 in. and 30 in. Hg. Failure of the electrical circuit does not result in brake failure; the time lag merely reverts to what it would be without the Rippon equipment.

The development is a commendable step to improve the efficiency of the cheap and simple vacuum brake in those marginal applications where, with the increased speeds and weights now permitted, its suitability is in question. Arrangements have been made by Rippon Bros. for production of the equipment, which will be available in quantity in September, together with layout instructions, both to operators for conversion of their existing vehicles and to manufacturers for incorporation in new vehicles.

The address of the Midland regional office of J. W. Roberts, Limited, manufacturer of Ferobestos sprayed Limpet asbestos and allied products, is now Somerset House, Temple Street, Birmingham, 2. The telephone number is Midland 1367.

Firth Cleveland Finance, Limited, has opened two branch offices, one in London at County House, 45 East Hill, London, S.W.18, and one in Sheffield at 15-17 York Street, Sheffield, 1. Firth Cleveland Finance is a new project of the Firth Cleveland Group, with its head office at 8 Cleveland Row, London, S.W.1. It is concerned with financing hire purchase transactions for all sections of the motor trade and industrial plant.

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## L.T.E. ORDERS TUBE TRAINS

### Completion of Piccadilly Line Re-equipment

APPROVAL has been given by the British Transport Commission to the placing of orders by the London Transport Executive for 76 seven-car trains for the Piccadilly Line at a cost of £10,120,000. The main orders—the biggest for Underground trains since the 1939-45 war—have been placed and the trains will be delivered between the autumn of 1959 and mid-1962. This will mean complete replacement of rolling stock on the Piccadilly Line except for 15 modern trains now in service and the three prototype silver tube trains which have been running on the Piccadilly Line for some months.

As with the prototypes, the design of the new cars incorporates features first introduced in the 1938 tube stock. The major changes from the 1938

designed to facilitate maintenance and improve reliability; and a roller blind destination indicator above the centre cab doorway, illuminated by a fluorescent lamp. Fluorescent lighting also illuminates the train number plate cabinet. Features such as trackless doors, mercury type door interlocks, door fault indicator lights, rubber window glazing, etc., which have proved their worth in service and were also incorporated in the prototype silver tube trains, have been continued. A new type of motor generator, incorporating a separate alternator to feed the fluorescent lighting circuits has been designed to eliminate the undesirable noise associated with the machines fitted on the prototype trains.

As a first step towards the improvement of

#### PRINCIPAL CONTRACTORS

PICCADILLY LINE			
The principal contractors for the Piccadilly Line trains are as follows:			
Car bodies and bogies	Metropolitan-Cammell Carriage and Wagon Co., Limited	Roller bearing axleboxes and suspension bearings	Hoffmann Manufacturing Co., Limited
Traction control equipment and auxiliary equipment	British Thomson-Houston Co., Limited	Bolster and axlebox suspension	Metallastik, Limited
Traction motors	General Electric Co., Limited	Loudaphones	Clifford and Snell, Limited
Brake equipment	Westinghouse Brake and Signal Co., Limited	Batteries	Peto and Radford, Limited
Motor generators	Metropolitan-Vickers Electrical Co., Limited	Auxiliary electrical equipment	Patent Lighting Co., Limited
Door equipment	C. D. Peters and Co., Limited	Lighting and auxiliary equipment	Benjamin Electric, Limited
Automatic couplers and connecting units	A.E.C., Limited		
METROPOLITAN LINE			
Cars for the Metropolitan Line have not yet been ordered, but contracts with some of the above firms include certain equipment for the new Metropolitan Line trains. These are as follows:			
Traction control equipment and auxiliary equipment	British Thomson-Houston Co., Limited	Automatic couplers and connecting units	A.E.C., Limited
Traction motors	General Electric Co., Limited	Auxiliary electrical equipment	Patent Lighting Co., Limited
Brake equipment	Westinghouse Brake and Signal Co., Limited	Lighting and auxiliary equipment	Benjamin Electric, Limited
Door equipment	G. D. Peters and Co., Limited		

stock are the use of rubber for the bogie bolster and axlebox suspension, with the object of eliminating wearing parts which necessitate heavy maintenance expenditure and incidentally of giving passengers a smoother ride; the use of fluorescent lighting; and the panelling of the cars in unpainted aluminium alloy sheeting. The placing of control equipment underneath the floor gives about 15 per cent increased passenger capacity compared with the stock now being replaced.

#### Results of Trials

Other features of the new trains which have been incorporated after trial on the three prototypes are a better arrangement of transverse seats in the centre bay; improved retractable shoegear; a modified electro-pneumatic brake system

Central Line services, some of the present Piccadilly Line stock will be transferred as soon as new Piccadilly trains are received, so as to increase the length of all Central Line trains to eight cars. At present, 31 of the 79 trains in scheduled service on the Central Line are of seven-car length. Both the Piccadilly and Central Lines are heavily taxed in the rush hours but new rolling stock is being assigned to the Piccadilly Line first because this will enable relief to be given to both Lines simultaneously. The Piccadilly Line will benefit from the increased capacity of the new cars and the Central Line will benefit from the lengthening of its trains. If the Central Line received the new rolling stock first, the Piccadilly Line could not be relieved in any way, because its below-ground stations cannot take trains of greater length than seven cars.

## Electrical Equipment

### FOR THE FORD THAMES FOUNDRY

MAXIMUM mechanisation of processes in the new Thames Foundry of Ford Motor Co., Limited, which has a daily capacity of 400 tons of castings and was completed in only two years at a cost of over £7 million, called for electrical power requirements of 15,000 kVA—equivalent to the domestic electricity demand of a large town. To meet this load, two 11-kV supplies are taken direct from the main Ford powerhouse—about one mile distant from the foundry—to a main intake building which is at a height of 70 ft. on the foundry roof. Housed in the main intake room is a Crompton Parkinson type CLA3 seven-unit metal-clad 11-kV 500-mVA duplicate busbar switchboard, which controls two incoming supplies from the power house and four feeder units supplying two foundry HV distribution rings. A busbar coupler unit is also incorporated in the switchboard.

In the HV distribution rings are eight substations—the present requirements of the foundry being 14.5 mVA of transformer capacity consisting of nine 1,500-kVA units and one 1,000-kVA unit. The supplies from the switchboard to the foundry are taken through British Electrical Transformer Company reactors which reduce the fault power level from 500 mVA to 350 mVA. At strategic points in the foundry distribution rings, Crompton Parkinson type CLA2 three-unit 350-mVA 11-kV metal-clad switchboards are installed, two units of which control the ring circuit, the third unit controlling a local 1,500-kVA step-down transformer. There are six such substations installed at roof level and one of 1,000 kVA capacity used solely to supply power for the dust-extraction plant.

The transformers, all manufactured by the British Electrical Transformer Co., Limited, are fitted with Buchholz protection operating in conjunction with relays provided on the switchgear. Connections to the HV sides of the transformers are made by cable while the LV sides are arranged to take metal chambers housing bare copper connections to the LV distribution switchgear. The LV switchboards of Johnson and Phillips manufacture are of the Metalclad horizontal drawout type having a breaking capacity of 30 mVA at 415 volts.

#### Heating and Ventilation

An outstanding feature of the foundry is its heating, ventilating and air-purifying system, which warms the building and changes the entire air con-

tent more than seven times an hour and as many as 16 times an hour in the fettling and moulding department. This air-conditioning is achieved by means of 12 Crompton Parkinson 75-h.p. auto-synchronous motors driving centrifugal ventilation equipment and special dust-extraction systems—Rotoclon hydrostatic precipitators—which collect dust from source and deliver it to wet-type separators and motor-powered sludge ejectors on the foundry roof.

A further 35 Crompton Parkinson motors, ranging in size from 1 to 140 h.p., are also used for ventilation work, making a total of over 3,000 h.p. employed solely for air-control purposes. Compressed air is widely used in the foundry for process work and this is provided by 10 Reavell and Company double-acting two-stage compressors (delivering 7,600 cu. ft. of free air per min.) each driven by a Crompton Parkinson 175-h.p. auto-synchronous motor. The extensive use of auto-synchronous motors allows this new foundry to gain optimum benefit from a good power factor which, at the moment, is approximately .87 lag.

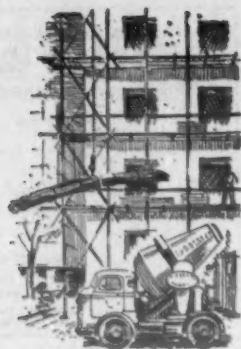
## TICKET MACHINE MAKERS

### Gibson Firm Acquired

NEGOTIATIONS have now been completed for the acquisition by Mycalex and T.I.M., Limited, the Cirencester ticket issue machine manufacturers, of Ticket Equipment, Limited, the company which makes the Gibson ticket machine. It is the intention of Mycalex and T.I.M., Limited, to continue the manufacture of the Gibson machine as an addition to its present extensive range and to market all the machines through the medium of the newly acquired company.

One of the objects of this merger is to enable the company to extend the range of machines at the disposal of its agents throughout the world, and to pursue a more intensive development programme with the object of meeting the increasingly exacting demands of transport operators under present-day conditions. It can be anticipated that before long there will be news of interesting new developments from this source.

## A concrete case for COMMER!



Part of a fleet of 10 diesel-engined Commer 7 tonners recently delivered to Hall & Co. Ltd. Each vehicle is fitted with a 3 cu. yd. capacity agitator and is used to deliver ready-made concrete. A further 5 vehicles of like type are also on order from these well-satisfied operators.

LIKE MANY OTHER major undertakings, the success over the years of Hall & Co. Ltd. is coupled with their choice of transport. Significantly, they have long employed Commer vehicles on various transport tasks, and are among the very many forward-marching firms who continue to rely on Rootes diesel-engined Commer 7-12 tonners to solve their transport problems, economically and efficiently.

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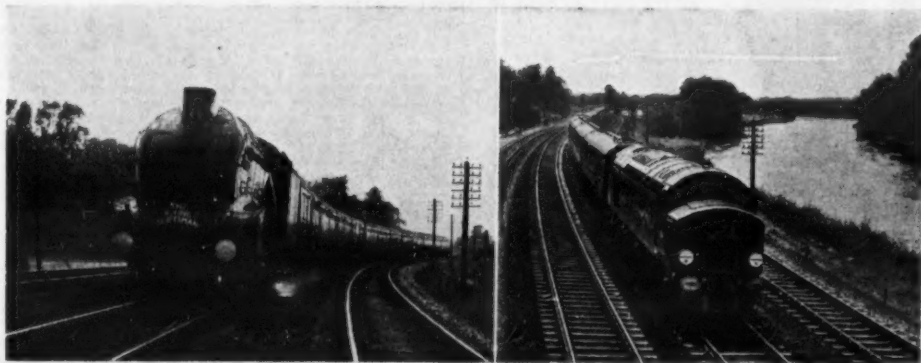
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A contrast in motive power is provided by these two views taken on the same day on the Eastern Region near Orford and Buckden Station. Left: the down Flying Scotsman hauled by Class A4 Pacific "Silver Fox" and, right, the down Heart of Midlothian headed by Type 4 English Electric 2,000-h.p. diesel-electric locomotive No. D206



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## LETTERS TO THE EDITOR

**The Steam Locomotive in Decline**

**SIR,**—It is the natural corollary of the current modernisation plan for British Railways, with its emphasis upon the substitution of electric and diesel motive power for steam, that the steam locomotive should progressively become extinct. The further emphasis in the plan, that passenger-train services will be dieselised first, to be followed at a somewhat later stage by freight inevitably means that the steam passenger locomotive shows a greater measure of decline, as compared with the freight locomotive, which will undoubtedly be with us for a number of years yet. Appreciable public mention has been made recently of the final extinction of the Atlantic (4-4-2) type tender engine with the withdrawal from service of the former L.B. and S.C. No. 32424, *Beachy Head*. Little if any notice would appear to have been attracted, however, to the early demise of the once considerably more numerous 2-4-0 tender type, as soon as the remaining engine of this type, the former Great Eastern Railway Class E4 Holden locomotives of 1891, of which No. 62785 is the last, is withdrawn from service; it might well be that efforts should be made to preserve it as a specimen of this class before it is too late.

## Comparison of Types

In this connection it is perhaps interesting to compare the position today as regards the stock of passenger tender locomotives with that obtaining at December 31, 1922, immediately prior to the dissolution of the old railway companies under the Railways Act of 1921. At that date types of wheel arrangement and numbers of each were as follows:

4-2-2	49	(49 single drivers)
0-4-2	197	
2-4-0	618	
4-4-0	3,215	(4,325 four-coupled)
4-4-2	295	
2-6-0	420	
4-6-0	1,383	(1,808 six-coupled)
4-6-2	5	

A number of the 2-6-0 and 4-6-0 machines was utilised either on mixed traffic turns or solely on freight work.

The 4-2-2 locomotives rapidly declined in number and by December 31, 1928, this type was represented by one machine only—the celebrated *Caledonian* No. 123, now happily preserved for posterity and in fact recently "out on the road" again with light special trains. The 0-4-2 type like-

wise, which in 1922 was in use by five of the former companies, had by the end of 1930 dwindled to a total of 76, mainly Southern Railway, which at its formation on January 1, 1923, possessed 116 of this type (90 L.S.W.R. and 26 L.B. and S.C.—the celebrated *Gladstones* in the latter case).

## Fate of 2-4-0 Type

Whilst the 4-4-0, easily the most numerous of individual passenger types in 1922, is still relatively well represented, the 4-4-2, as already mentioned, is now extinct. The 2-4-0 type, numbering 618 at the close of 1922, was in use on no fewer than 16 of the pregrouping railways, ranging in numbers down from 245 on the Midland, 112 on the L.N.W. and 100 on the Great Eastern to a single representative each on the L. and Y., Furness and S.M.J. companies. It was the sole passenger-type tender engine owned in the case of the last-mentioned railway. It seems somewhat surprising that the last few survivors of this main-line express passenger type of the late 19th century should be of G.E.R. origin rather than Midland or L.N.W., doubtless, one would like to feel, in the nature of a tribute to the sound workmanship emanating from Stratford Works.

As regards six-coupled passenger engines, whilst 1,808 of the combined 4-6-2, 4-6-0 and 2-6-0 types were in existence at December 31, 1922, by the end of 1930 the number had appreciably increased to a total of 2,686, including 75 Pacific on the L.N.E.R., which company on its foundation possessed four only of this type (the fifth machine to make up the total of five at amalgamation was of course the celebrated *Great Bear* of the old Great Western—for many years the sole locomotive of this wheel arrangement). Since 1930, however, there has been a progressive reduction of numbers in the case of the 4-6-0 and 2-6-0 machines, although with the subsequent advent of Pacifics on the former L.M.S.R. and the Southern Railway the 4-6-2 continued for some years to increase. All three types, in common with the 4-4-0, seem likely however, to remain in use for some years to come.—Yours faithfully,

J. H. SEWELL.

*Yew Tree Cottage,  
Great Horshesley,  
Colchester, Essex.*

## Sad Story of a Canal Bridge

**SIR,**—The story of the Narrow Street Bridge, Stepney, as told in your issue of July 26, was not quite complete. What you did not mention—although Lord Ebbisham had done so earlier in a letter to *The Times*—is that the Ministry of Transport and Civil Aviation have indicated that they would be prepared to consider making a contribution towards the cost of rebuilding the bridge to modern standards. I think this answers your point that the Ministry should assist the Stepney Borough Council to make an improvement for the general good.

In addition, the L.C.C. have said that if an approach by Stepney Borough Council is made to them for help they are willing to consider it.—Yours faithfully,

R. G. S. HOARE,  
Chief Information Officer,  
Ministry of Transport.

*Berkeley Square, House, W.1.*

## Brussels Ferry Delays

**SIR,**—I recently travelled from London to Brussels on the Night Ferry. This is the only through working of passenger carriages from this country to another and is a much advertised de luxe service. It was 37 min. late leaving Victoria, due apparently to the rostered driver requiring his meal break. The driver may well, for safety reasons, have been right. Could not, however, those responsible for this service have taken steps to rectify the position? Instead, apart from an apology for delay on the loudspeaker, nothing appeared to be done. With many transatlantic visitors on the train, one felt ashamed of being British if it was thus that our railways managed what should be one of their showpieces. It may be remarked that no senior station officials were apparent on the platform.

The result of the late start was a missed connection at Lille for the train to Brussels. So the through sleeping-cars were parked at Blandain whilst passengers took coffee at a village cafe and arrived at Brussels over an hour late; from the way in which the Wagons-Lits attendants arranged matters at Blandain, it seemed that it had happened before. That was, however, more in keeping with the early days of railway travel than with a de luxe train in 1958 and small consolation for those with connections to catch in Brussels—all due to British Railways. Later that second day the writer travelled on the Edelweiss; that train crosses four frontiers but was, of course, running exactly to time.—Yours faithfully,

PETER PROUD.

*1 Verulam Buildings,  
London, W.C.1.*

[On the assumption that the date was July 11, when, because of heavy traffic, the Night Ferry ran in duplicate with the Brussels sleeping-cars due to leave Victoria on the second portion at 10.4 p.m., a Southern Region spokesman advises us that the engine of this train was booked to be worked by a crew of an incoming boat train; the train was late in getting up to Victoria because it had to wait for a boat seriously delayed by fog in the channel. It was a summer Friday evening with heavy traffic movements and it will be appreciated how difficult it is to find a relief crew quickly in those circumstances. As it was the train left at 10.37 p.m.—just 16 minutes after the crew arrived on the incoming train.

It is difficult to see what a senior station official could have achieved by being on the platform. Either a relief crew could be found or it could not. "We do assure your readers that whatever arrangements Wagons-Lits may make on the other side, we go to very great lengths to try to ensure that connections are made on all our services and we have a good record in this matter. So seriously do we take any failure to maintain this standard that inquiries are still going on to ascertain whether the measures taken in this particular case were the best possible."—Editor, MODERN TRANSPORT.]

The Editor is always glad to receive letters from readers on subjects germane to the transport industry, but these should be written as concisely as possible. The opinions expressed therein must not, however, be regarded as having editorial endorsement. Where correspondents desire to use a nom-de-plume it is essential that the Editor should be informed of the name and full address of the writer as indication of good faith.

Barco Trading Co. S.A., 17 Rue de Marche, Geneva, has been appointed agent for the sale of Leyland lorries, buses and industrial engines in Switzerland.

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## SOCIAL AND PERSONAL

### Chairman of Vauxhall Motors

It was announced last week that Mr. G. N. Vansittart is to retire next month as chairman of Vauxhall Motors, Limited; he is 65. His successor is Mr. Philip W. Copelin who has been managing director of the company since July, 1955, and will retain this position. Mr. J. R. Pearson, O.B.E., has been elected deputy chairman. Mr. A. W. Laskey, assistant managing director, is also to retire at the end of next month.

The death is announced of L. A. G. Strong, author and journalist. Among his books was *The Rolling Road*. He was 62.

Mr. A. G. Curtis, O.B.E., M.Inst.T., as already announced, has been appointed Transport Commissioner for Wales and Monmouthshire to represent the Ministry of Transport and Civil



Mr. A. G. Curtis

Aviation in that area. He served for many years in the East Midland and Northern traffic area offices before and during the 1939-45 war. He was chief assistant in the latter office before transferring, on promotion, to the headquarters of what is now the Ministry of Transport and Civil Aviation, where he was an Assistant Secretary before becoming East Midland area Licensing Authority in 1953.

Mr. O. W. Minshall, B.Sc., M.I.E.E. has been appointed general manager of the power cables division of British Insulated Callender's Cables, Limited.

Mr. L. Holgate, previously in charge of planning and rate-fixing at the south works factory of Leyland Motors, Limited, has been appointed chief time study engineer (headquarters) of the company.

Mr. J. Handley has been appointed stationmaster at St. Pancras. He moves from Derby to this new appointment. Mr. Handley started life as a junior clerk at Emneth (Great Eastern Railway) in 1916 and in 1935 became stationmaster there.



Mr. A. Griffiths, O.B.E., director and general manager of the Daimler Co., Limited (left) shaking hands with Councillor W. Spencer, chairman of Coventry Corporation Transport Committee, on the occasion of the handing over of one of 50 CVG6 double-deck buses ordered by Coventry Corporation Transport. They have 60-seat M.C.W. lightweight bodies. Also seen, left to right, are Messrs. R. S. Crouch, sales manager, Transport Vehicles (Daimler), Limited; Councillor W. R. Jones, vice-chairman of Coventry Corporation Transport Committee; and R. J. Gates, chief assistant engineer, and R. A. Fearnley, general manager and engineer, Coventry Corporation Transport.

We regret to record the death of Mr. D. Lemon, A.S.A.A., M.Inst.T., late research officer, Port of London Authority.

Mr. Paul N. Matton, managing director of Trico-Folberth, Limited, was nominated president of the international jury to adjudge and allocate awards to exhibitors in the road transport classifications at the Brussels Universal and International Exhibition. Under his presidency the jury consisted of three Belgians, three Frenchmen, three Russians and one Italian.

Electrical and signal engineer to the Ulster Transport Authority since its formation in 1948 Mr. F. G. Marshall, M.I.E.E., has recently resigned this position and transferred his activities to the Bristol area, where he is setting up an electrical agency to represent a few leading electrical manufacturers in the South West of England, and in South Wales. Before joining the U.T.A., he was from 1939 onwards electrical and signalling assistant to the L.M.S. (Northern Counties Committee) in Belfast.

Mr. John Dengate, who, with his brother, founded the bus business now known as John Dengate and Son, Limited, Beckley, Sussex, operating in the Hastings area, has died at the age of 84. One of the very few private bus undertakings in Kent and Sussex, Dengate operated since 1919 and has regular services from Hawkhurst to Rye (joint with Maidstone and District) and Beckley to Hastings. It has 10 vehicles and carries half a million passengers a year. Mr. John Dengate was once a baker in Battle, and was delivering bread in a motor vehicle before registration plates were issued in 1903.

### Management Courses at Ashridge

ASHRIDGE College, near Berkhamsted, Herts, a large residential college offering adult education courses in a wide range of subjects—including transport, in which it collaborated with the Institute of Transport—has a new governing body and is to concentrate on developing the arts of management in industry, while continuing its previous activities. It is hoped to issue a brochure giving the new curriculum in the autumn. The new principal is Major-General E. N. K. Estcourt, formerly Deputy Commandant of the N.A.T.O. Defence College; among the new governors are Mr. C. M. Vignoles, managing director of Shell-Mex and B.P., Limited, Sir Walter Benton Jones, chairman of United Steel Companies, Limited, and Mr. E. W. Senior, chairman of Ransomes and Marles Bearing Co., Limited. Sir Alexander Carr-Saunders, a director of the London School of Economics until 1956, remains a governor.

We regret to record the death of Mr. W. E. Swinett, secretary of the Railways Amalgamation Tribunal in 1921-23. He was 77.

The address of Mr. M. I. Berrill, hon. secretary of the Railway and Canal Historical Society, is now 33 Top Road, Calow, Chesterfield, Derbyshire.

Mr. F. Marsden, who has been appointed Irish traffic officer, Euston, London Midland Region, B.R., will be responsible for Irish commercial matters. He was formerly assistant Irish traffic superintendent.

Mr. Marsden, who began his railway service with the former North Staffordshire Railway at Stoke-on-Trent in 1917, has wide experience of shipping and Irish traffic problems. He was assistant docks manager, Barrow-in-Furness, in 1943, assistant district commercial superintendent, Barrow, in 1946, and became shipping traffic superintendent, Belfast, early in 1950. In 1952 he was appointed acting assistant Irish traffic superintendent (London Midland, Western and Scottish Regions) with headquarters at Euston, which was confirmed in 1954.



Mr. F. Marsden

The death is announced of Mr. Malcolm Lockheed, aged 70, a founder of the American aircraft corporation. He sold his interest in 1930.

Mr. L. Hyland is to succeed Mr. G. Boughton as sales manager, B.O.A.C. western routes. Mr. Boughton is to become chief executive of Kuwait Airways, an associate of B.O.A.C.

A memorial service for Mr. Guy Campbell, the late chairman of the Benjamin Electric, Limited, will be held at St. Columba's Church, Pont Street, London, S.W.1, on Monday, September 8, at 3 p.m.



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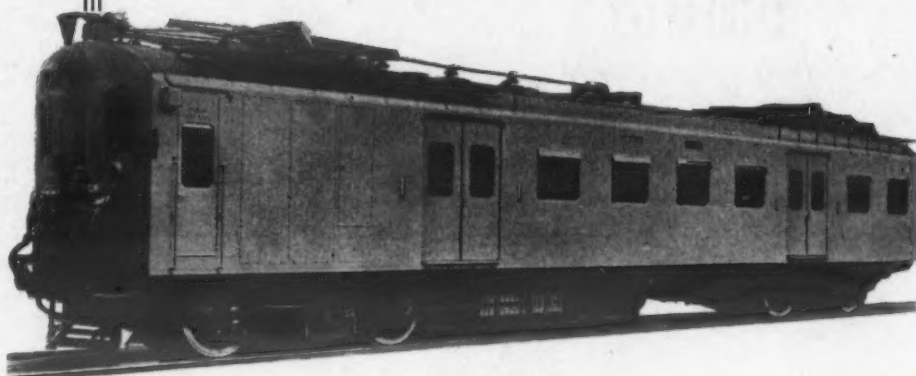
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One of the new suburban train 1st class motor-coaches for the Reef System now in service on South African Railways.

Designed and supplied by  
**METROPOLITAN-CAMMELL CARRIAGE & WAGON CO. LTD.**

who, as main contractors, are supplying 70 motor-coaches and 123 trailers, whilst 35 motor-coaches and 121 trailers are being supplied by The Birmingham Railway Carriage & Wagon Co. Ltd. The main electrical items were provided by Metropolitan-Vickers Electrical Co. Ltd

These Coaches are

fitted with

**WESTINGHOUSE**  
**ELECTRO-VACUUM**  
**BRAKE EQUIPMENT**  
with air controls for the auxiliaries

Made in England by—

Westinghouse Brake and Signal Co. Ltd., 82 York Way, Kings Cross, London, N.1

India—Saxby & Farmer (India) Private Ltd., Calcutta  
Australia—Westinghouse Brake (Australasia) Pty. Ltd., Concord West, N.S.W.  
South Africa—Westinghouse Brake & Signal Co. S.A. (Pty.) Ltd., Johannesburg  
Agents:—Bellamy & Lambie, Johannesburg

80 YEARS EXPERIENCE IN DESIGN AND MANUFACTURE OF RAILWAY BRAKES



**Inland Waterways****THE BOWES REPORT**

More and better use could be made of Britain's canals and navigable rivers, and a number of the former which have fallen into disuse could economically be restored. This is the conclusion of the Bowes Committee of Inquiry appointed by the Minister of Transport and Civil Aviation in 1956. Their report is also concerned with the future administration and financial arrangement for waterways which cannot be used economically for transport purposes, and with the conversion to other uses of certain canal sites.

6s. 6d. (post 6d.)

**London Traffic 1957**

Traffic in and around London still presents problems peculiar to the area. During 1957 the work of the London and Home Counties Traffic Advisory Committee was directed largely towards the solution of local problems of congestion aggravated by the "immediate and vigorous increase in London Traffic" at the end of the petrol shortage. They believe the results will make "a significant contribution towards improving the general flow of traffic in London".

3s. 6d. (post 4d.)

**HMSO**

from the Government Bookshops  
or through any bookseller

**IMPORTANT CONTRACTS****Large Scottish Omnibus Order**

IT was announced on August 18 by Mr. James Amos, chairman and managing director, Scottish Omnibuses, Limited, that orders for 288 new buses and coaches at a cost of £1,370,000 had been placed as part of the replacement programme of its group of companies for 1959. The double-deck vehicles involved will be 30 ft. long. Nearly half the bodies will be built by W. Alexander and Co. (Coachbuilders) and other bodybuilders involved are Eastern Coach Works, Northern Counties, and Park Royal. The chassis supplied will be principally of A.E.C., Bristol, Guy and Leyland manufacture.

**Dunlop Tyre Factory in Turkey**

The Dunlop Rubber Co., Limited, has entered into an agreement with Federal Turk Kamyonlari A.S., of Ankara, for the establishment of a tyre factory in Turkey, with the approval and support of the Turkish Government. Dunlop Advisory Service, Limited, will design the factory, which will satisfy the major portion of Turkey's tyre requirements; the Dunlop Rubber Co., Limited, will acquire a financial interest in the project.

**Daimler-Benz Bus Exports**

Daimler-Benz A.G., Stuttgart, will export 2,900 Mercedes-Benz buses this year. The larger fleet orders, of which approximately two-thirds are already completed, include more than 1,300 O321H chassis to Brazil, 700 complete units of the O321H to Iran, 150 O315s to Greece, 150 OP315s to Ceylon and Pakistan and about 250 of the small O319 buses to Sweden, Iraq, Nigeria, Venezuela, Ghana and Cambodia.

**Southern Region Contracts**

The Southern Region of British Railways has placed the following contracts:

G. E. Wallis and Sons, Limited, London, W.C.2, for reconstruction of Higham Road Bridge.  
Joseph Westwood and Co., Limited, London, E.14, for construction of steelwork at Westminster Station.  
Dorman Long (Civil Engineering), Limited, Luton, for part reconstruction of bridge at Clapham Junction.  
Simmons and Hawker, Limited, London, S.W.18, for structural steelwork for colour-light signalling, Clapham Junction to Richmond.

The Walter Kidde Co., Limited, Greenford, for installation of automatic fire protection at Point Pleasant, Gatwick and Chislehurst Junction signalboxes.  
Joseph Westwood and Co., Limited, London, E.14, for reconstruction of Coldharbour Lane Bridge, Brixton.

Aubrey Watson, Limited, New Malden, for repositioning platform and roofing at Redhill.  
Mears Bros. (Contractors), Limited, London, S.E.26, for reconstruction of two bridges at Woolwich Arsenal and one bridge at Appledore.

**Cable For Kent Coast**

Manufacture and supervision of the installation of the bulk of the high-voltage and associated cables for the second phase in Stage 1 of the electrification extensions to the Kent Coast will be carried out by Pirelli-General Cable Works, Limited (an associate of the General Electric Company) under a contract awarded by the Southern Region of British Railways. Some 140 miles of 3-core 33-kV oil-filled cable and approximately 140 miles of pilot-supervisory cable are involved in the contract. Manufacture is due to begin immediately and a rigid programme has been tabled to ensure the completion of all installation work by mid-September, 1961.

**A HOUSE JOURNAL****For Self-Changing Gears**

ENTITLED *Transmission Times*, a new house journal published by Self-Changing Gears, Limited, Lythalls Lane, Coventry, is due to make a first appearance in mid-September. It is intended to publish it quarterly for free distribution and the coverage will extend to information on the Wilson gearbox and other Self-Changing transmission components as applied in road, rail and marine service.

Individuals and firms wishing to have their names placed on the mailing list for *Transmission Times* should write to the editor, Mr. K. Montrose, at the Coventry address, who is also prepared to consider for publication any items of interest concerning the company's products.

**TENDERS INVITED**

THE following items are extracted from the Board of Trade Special Register Service of Information. Inquiries should be addressed, quoting reference number where given, to the Export Services Branch, Board of Trade, Lacon House, Theobalds Road, London, W.C.1.

August 29—Union of South Africa.—Transvaal Provincial Administration for three Class I CRAWLER TRACTORS with hydraulic ANGLEDZERS and rear-mounted RIPPER, and 10 Class I CRAWLER TRACTORS with hydraulic ANGLEDZERS and C-frame SCRAPERS. Tenders to the Chairman, Transvaal Provincial Tender Board, P.O. Box 1040, Pretoria. (ESB/2055/58.)

September 5—Union of South Africa.—South African Railways for two 2½ cu. yd. crawler tractor-mounted FRONT-END LOADERS. Tenders to the Chairman of the Tender Board, P.O. Box 7784, Johannesburg. (ESB/20144/58.)

September 8—Ceylon.—International Co-operation Administration for two four-wheel-drive 7,500-lb. g.v.w. LOBBERS with 6,000-lb. capacity winches. Tenders to the Chairman, Tender Board, Ministry of Lands and Land Development, Tender ICA-179, P.O. Box 500, Colombo, 1. (ESB/19654/58/ICA.)

September 16—Thailand.—Thai Technical and Economic Committee for 80 steel UNDERFRAMES for bogie tank wagons complete. Photocopies of tender documents from Export Services Branch, B.O.T., price 20s. (ESB/19591/58.)

**FINANCIAL RESULTS**

NOTES on the trading results, dividends and financial provisions of companies associated with the transport industry are contained in this feature, together with details of share issues, acquisitions and company formations or reorganisations.

**Beyer Peacock and Air Control Installations**

Beyer Peacock and Co., Limited, has agreed to acquire the £100,000 Ordinary capital of Air Control Installations, Limited (£50,000 each in "A" and "B" shares), and the £1,000 capital of B. J. N. Engineering, Limited, on a share exchange basis.

**Thorn Electrical Industries**

Group net profit of Thorn Electrical Industries, Limited, in the year ended March 31 was £681,832 (£635,054). An expansion from £15,718,161 to £21,649,801 in total group assets is shown in the accounts.

**Associated British Engineering**

The automotive and industrial division is still operating at a loss, states the annual report of Associated British Engineering, Limited. The principal subsidiary, Henry Meadows, Limited, received a contract worth over £400,000 from the Argentine Government during the past year, and has recently received encouraging orders from Australia.

**Kirkstall Forge Engineering**

The fall from £460,060 to £424,337 in the trading profits of Kirkstall Forge Engineering, Limited, during the year ended June 30 is mainly attributed to a contracting market and to the necessity to accept smaller profit margins. Now almost completed, a major development scheme has been financed entirely out of internal resources.

**SHIPPING and SHIPBUILDING****Withdrawal of Skye Mail Steamer?**

REPRESENTATIVES of David MacBrayne, Limited, the Highlands and Islands Advisory Panel and the Inverness County Council were to meet on Wednesday this week to consider proposals for a major reorganisation of existing steamer services. One proposal which was likely to meet with opposition was the withdrawal of the mail steamer *Loch Nevis* from the Mallaig—Kyle of Lochalsh—Portree service. The advisory panel justifies the proposed withdrawal by pointing out that Skye is, in effect, no longer an island because of the considerable improvement in vehicular ferry services.

**Oil Jetties at Grangemouth**

WORK has started on two jetties at which small coastal vessels will be able to load refined products from the B.P. Grangemouth refinery. They are situated in the Eastern Channel of Grangemouth docks, adjacent to the present tanker jetties.

**Free-Piston Conversion**

WORK is to begin by Smith's Dock Co., Limited, South Bank, Middlesbrough, on the conversion of the 2,487-ton Newcastle cargo vessel *Goodwood* from triple-expansion steam engines to a free-piston gasifier, which the Tees-side firm has been developing under licence for some time. The vessel, launched at Sunderland in 1949, is owned by France, Fenwick and Co., Limited.

**U.K. Consultants for Vishakapatnam**

TWO British firms are reported to have been approached by the Government of India to act as consultants to the Hindustan shipyard at Vishakapatnam. The contract with the French consultants, Ateliers et Chantiers de la Loire, is due to expire and is not likely to be renewed, following an inquiry into the working of the yard after faulty construction of ships there.

**Receiver for Bristol Company**

APPOINTMENT of a receiver has been announced by P. and A. Campbell, Limited, the Bristol Channel steamship company which operates between Cardiff and Weston-super-Mare, Bristol, Newport, Barry, and other summer trips. Passenger services will continue for the rest of this season as planned; the present financial difficulties are attributed to a series of bad summers. There are three steamships in commission and one laid up.

**Crawler Tractors in Ore Ship Holds**

SINCE the construction of a new deep-water berth two years ago, iron ore imports handled at Hartlepool have leapt from 130,000 tons to 600,000 tons per annum and are expected to continue to rise to 1,000,000 tons. This dramatic increase has been made possible to a large degree by the forward-looking approach of the authorities, who have completely mechanised grab-feeding operation in clearing holds. Using earth-moving equipment on British-made International crawler tractors, with only very minor modifications, in the holds of vessels, it is now possible to accelerate the turnround of 7,000- to 11,000-ton cargo vessels by as much as 16 to 24 hr.



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**For Calcutta Electrification . . .**

Coaches can be shipped whole or—as in the present order from Calcutta—partly knocked down, thus increasing the Indian labour content.

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